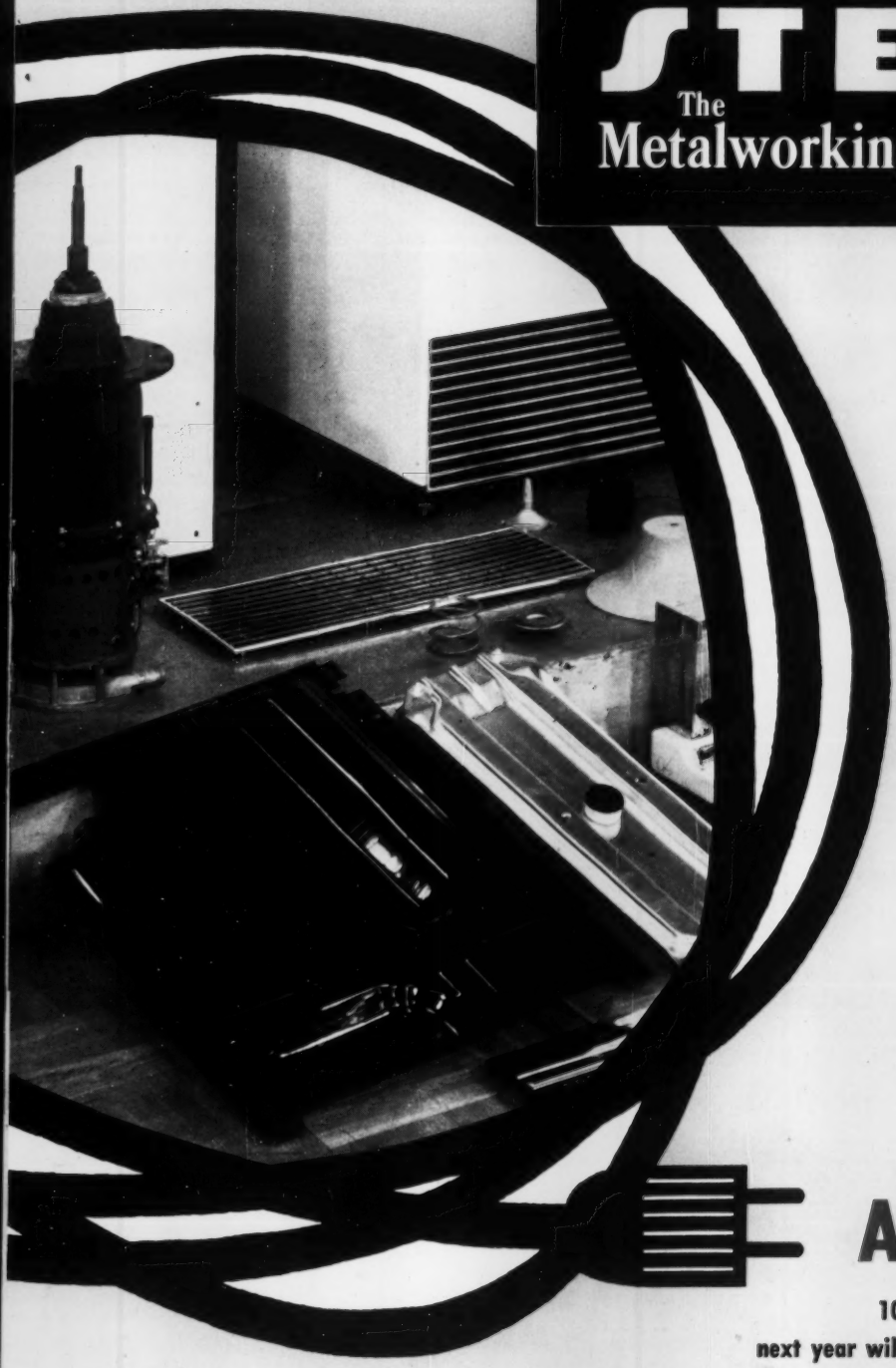
SEPTEMBER 9, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Appliances:

10 per cent gain in production next year will bring cheer to hard pressed parts suppliers. But over the long pull, their role is diminishing
—Page 63

✔ **How To Improve Your Distribution . . . Page 74**

✔ **A New Stainless for Atomic Energy . . . Page 104**

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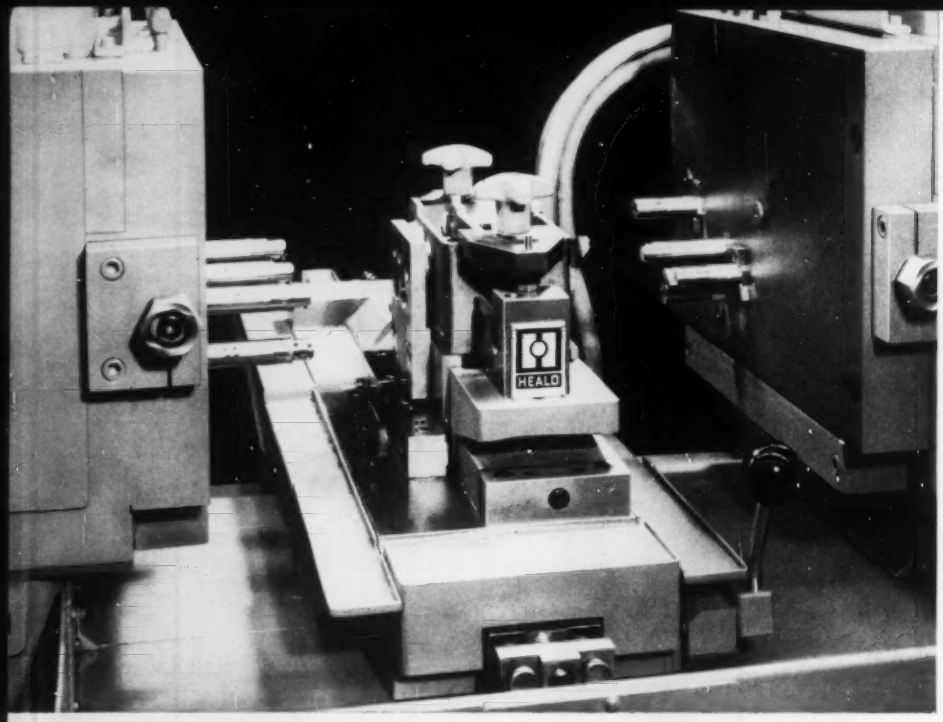
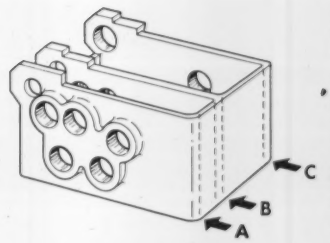
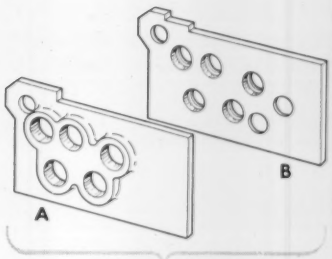
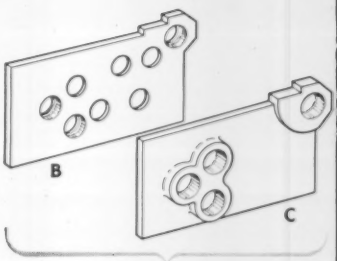






Holes Borized on Left End



Holes Borized on Right End

HOW TO BORIZE

MULTIPLE HOLES

ON CLOSE CENTERS

in one fully-automatic cycle!

New Multi-Spindle Boringheads make it as easy as A, B, C

PRECISION boring of closely-spaced multiple holes used to be a slow and laborious job – done one-at-a-time on large, costly equipment that required highly-skilled operators. But not any more!

The new Heald Multi-Spindle Boringheads put high-precision, close-center borizing on a mass-production basis. Used with any Heald Bore-Matic, this Multi-Spindle head will precision Borize any practical number of holes, on centers as close as ¾", at a single pass of the table – and duplicate the same operation again and again.

A Multi-Spindle head unit consists of a supporting frame which mounts interchangeable spindle plates, precision bored to receive the required number and arrangement of miniature precision Red-Head boringheads.

Any or all boringheads, including the smallest size, ¾", can be provided with hydraulic cross-feed units operated from a single cylinder. Job changeover is simply a matter of switching spindle plates, and mounting the miniature boringheads required.

For the complete story on this important new development, send for Bulletin 2-021-022-1 Issue 1.

HERE'S A GOOD EXAMPLE:

The Model 122 Bore-Matic shown above is equipped with Multi-Spindle Boringheads on both ends, to precision finish close-center bores in a small transmission housing. Each head consists of a group of miniature, precision Red-Head boringheads mounted on spindle plates that are jig bored for precise location of each Red Head. The setup shown, with 5 heads on the left and 4 on the right, is designed to bore and face 17 different holes. All operations are performed in a single, fully automatic cycle, with just one chucking of the work, and no indexing. The surfaces finished at each end of the machine are shown in the "exploded" part drawings above.

IT PAYS TO COME TO HEALD

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

HEALD®

How steel sheets help cut summertime labor

A scant decade ago power mowers were a comparative novelty on the lawns of Suburbia. Yet nowadays it's a rare homeowner who does *not* trim his grass with the time-saving assistance of power!

Yes, the power lawn-mower is another newcomer which takes a swelling tonnage of steel sheets for its construction. The deck of the mower shown here, for example, was made from Bethlehem cold-rolled sheet for rugged strength without unwanted weight. And the handles of most lawn-mowers now are sturdy, light-weight tubular members formed from strong sheet steel.

There are so many of these relatively new sheet-steel applications today! When you consider them, together with the continuing—and growing—needs of other, long-time users of sheets, it's no wonder sheet supplies have been so tight these past few years.

Bethlehem sheet mills at Sparrows Point and Lackawanna have been working hard to keep up with the demand. Now there's reason to believe that we are coming abreast of it. In brief, we welcome your inquiry.

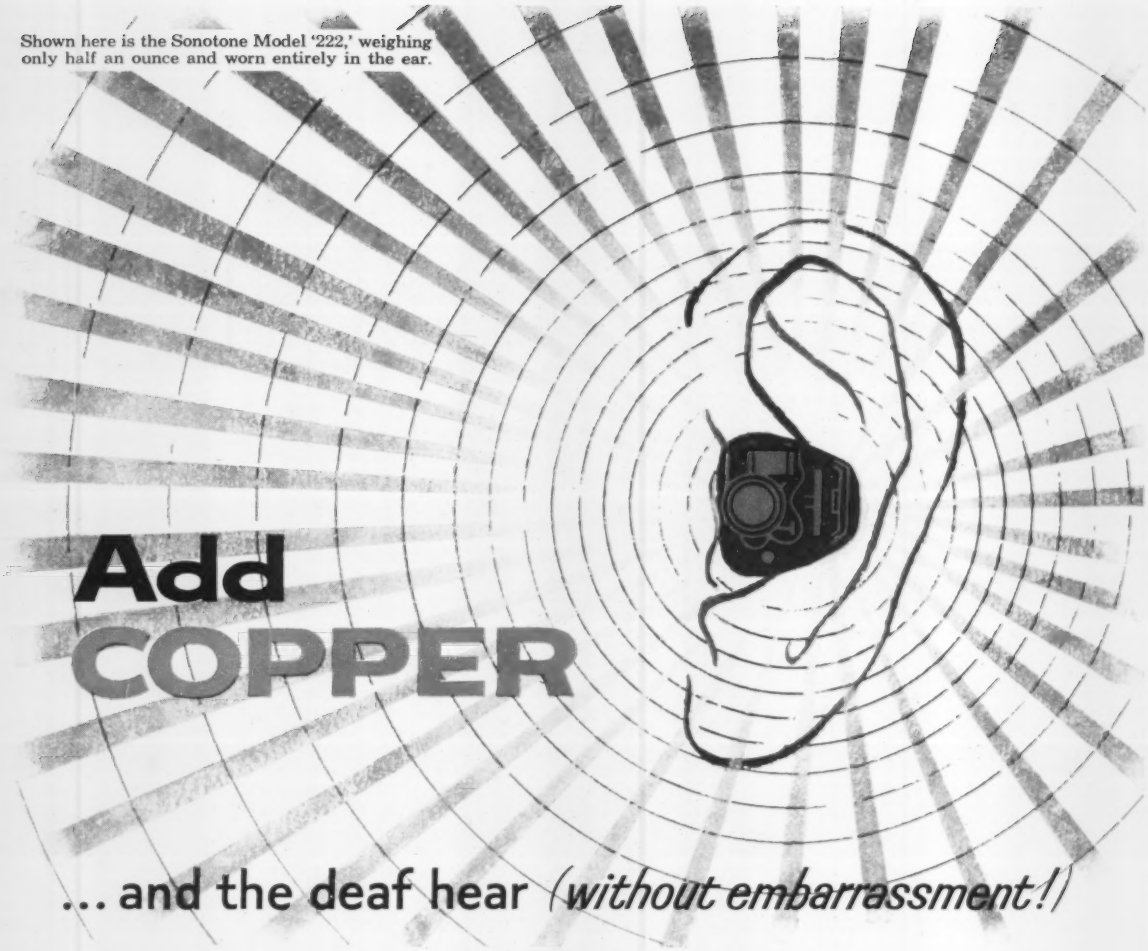
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM SHEETS

BETHLEHEM STEEL

Shown here is the Sonotone Model '222,' weighing only half an ounce and worn entirely in the ear.



Add COPPER

... and the deaf hear *(without embarrassment!)*

The hearing aid has proved a bigger blessing now that it has become *smaller*.

Thanks to Copper, one new hearing aid is not much bigger than a 5-cent piece. No outside cord. Inconspicuous, not embarrassing.

Its built-in receiver contains 1100 turns of Copper wire. That wire is only .0015-inch in diameter. Luckily Copper can be drawn hair-fine . . . for miles, if required . . . and still conduct current efficiently.

Copper's capacity to perform great deeds in small space is unique. The newer hearing aids are only one instance of the way this metal lends itself to modern miniaturization.

"Pocket" radios (with printed circuits) telephones, wrist watches . . . the list is endless! Copper and copper-base alloys "miniaturize" in new ways almost every day.

For regardless of product-size, the outstanding properties of Copper function efficiently. Electrical conductivity . . . heat transfer . . permanent rustlessness and excellent workability . . . these are some of Copper's great gifts to American invention and production.

Working with Copper your net cost is always lessened by the higher-cash-value of your manufacturing scrap!

Plan to use Copper in your product! Continuous expansion in the Copper Industry assures you an ample supply for your future needs.

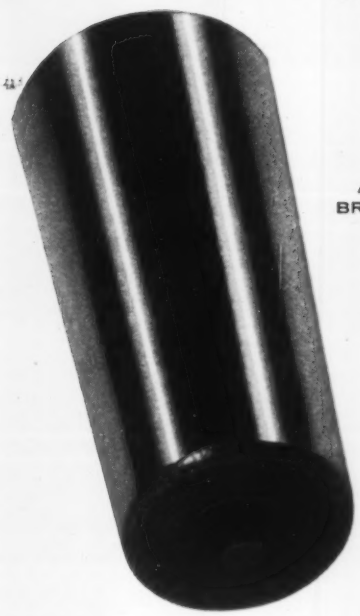
COPPER • BRASS • BRONZE

in over 40 Standard Alloys!

For other examples of miniaturization, write to the Copper & Brass Research Association, 420 Lexington Ave., New York 17

OSBORN® BRUSHING METHODS worthy of your confidence

BEFORE BRUSHING



AFTER BRUSHING

Precision brush finishing

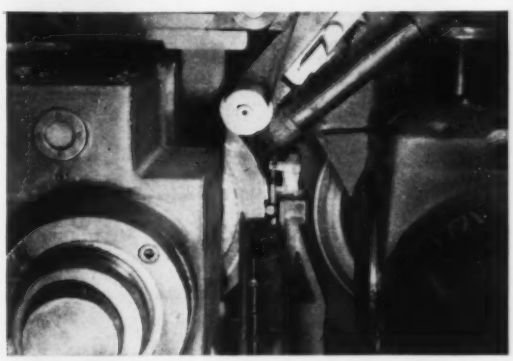
mass-production method

PRECISION parts by the thousands can be surface finished . . . at high, continuous rates. The method . . . Osborn Centerless Brushing . . . is fast, economical.

Cylindrical parts are fed past a revolving Osborn Matic® Brush. Surface finishes are refined to low microinch readings, grinding burrs are removed and surface junctures blended to reduce stress concentrations.

With Osborn Centerless Brushing, uniform quality of product is maintained. A wide variety of parts can be handled with the same basic brushing method.

Why not check what operations in your plant can be done at lower cost with power brushing. An **O**sborn **B**rushing **A**nalysis will show you how. There is no obligation, of course. Write today. *The Osborn Manufacturing Company, Dept. G-59, Cleveland 14, Ohio.*

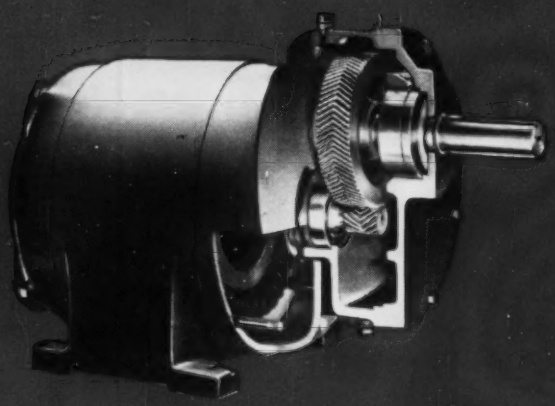


Cylindrical parts precision finished automatically and economically with Osborn Matic® Brushes.

Write TODAY for the new 100-page Osborn Catalog 210-C

Osborn Brushes

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY



SINGLE REDUCTION
Parallel Shaft Type

MASTER -1st Choice

for GEARMOTORS

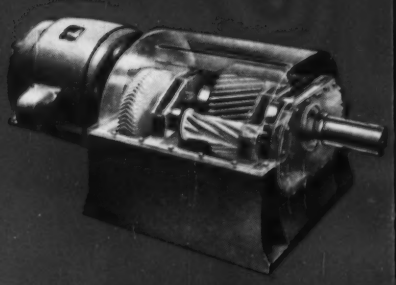
Because...

... With five types of parallel and right angle Gearmotors, Master has the flexibility and choice of design you need for selected output speeds.

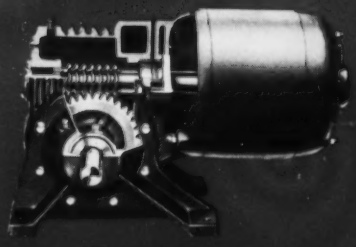
... With electric motor and gears combined into a compact, integral power unit, you reduce costs and increase efficiency through elimination of belts, couplings, chains, sprockets, external bearings or separate reducers.

... Available in sizes from 1/8 to 125 H.P. You can integrate with the gearmotor electric brakes—3 types of variable speed units and fluid drive in any combination.

... And that's why more gearmotors carry the Master name than all other makes combined. Write on your business letterhead for details.



DOUBLE REDUCTION
Parallel Shaft Type



SINGLE REDUCTION
Right Angle Shaft Type

THE MASTER ELECTRIC COMPANY

Dayton 1, Ohio

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The Metalworking Weekly

September 9, 1957
Vol. 141 No. 11

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CHILE	COLOMBIA	PERU	ARGENTINA
SPAIN	PORTUGAL	SO. AFRICA	SWEDEN
ISRAEL	JAPAN	BELGIUM	MEXICO
INDIA	AUSTRIA	BRAZIL	CANADA
ITALY	GERMANY	URUGUAY	ENGLAND
DENMARK	FINLAND	FRANCE	U. S. A.

24 NATIONS UNITED . . .
on Choice of Yoder Mills for Pipe and Tube Manufacture

It all started less than two decades ago with the introduction by Yoder—and the rapid adoption by American industry—of a revolutionary new type of mills for cold forming and electric-resistance welding of pipe and tubing. England, France, Italy, Mexico, Argentina, and Brazil soon followed the U.S.A. in adopting these mills. Other countries boasting any kind of modern metal working industry did likewise, even including distant Japan, India and South Africa. Production, depending on requirements, varies from 25,000 up to 75,000 feet per 8-hour shift.

•

By this time, England, Italy and Argentina each have a total of ten Yoder mills in operation; Brazil, eight; Mexico, six; France, five; other nations somewhat in proportion to their population. In many nations, Yoder mills now supply from 50% to 90% of all welded tubes used. Several outstanding production records have been scored by operators in foreign countries, most recently in Italy. Reasons: the simplicity of design, ease of operation and dependability of Yoder mills. Secondly, generous assistance rendered by Yoder in training operators everywhere.

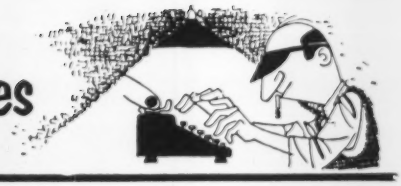
•

Through technological advances, Yoder leadership in tube mill design has been jealously maintained and strengthened from year to year. Ask for literature giving details of the latest improvements. Correspondence invited.

THE YODER COMPANY

5502 Walworth Ave. • Cleveland 2, Ohio, U. S. A.

behind the scenes



Appliance Analysis

Ben Franklin must be counted as one of the participants in the appliance market story appearing on page 63 in this week's STEEL. Appliances without electricity tend to slow down, and electricity without Ben loses its flavor. Before going into the market potential of appliances, factors affecting sales, effects of competition, home building, and the like, let's give thought to Franklin and his kite. He had no idea how close he came to being fried.

A story used to circulate in Kentucky about a colored farmer who took refuge under a tree during an electrical storm. A bolt reduced him to nothing much more than a collar button and some gold teeth, and the sorrowing friends who gathered his remains were able to place them in a shoebox. A preacher, hired for his mastery of big words, rose to the occasion when he shouted over the sparse fragments: "De Lawd couldn't wait for his servant, so he done summarized him at high noon."

The reason Franklin wasn't summarized when he played around with kites, keys, and wires during an electrical storm is wrapped up in the opening words of the definition of electricity appearing in the *Encyclopaedia Britannica*: "The phenomenon of electricity cannot be explained." Fortunately, Franklin beat the odds, and today electricity is the variable, restless, masterless thing that runs the appliances of the nation. It runs so many of them we are up to our ears in toasters, sweepers, irons, fans, frying pans, and mixers; yet the market is still booming.

Appliances have been sluggish in production, but not bad in retail sales, and there is evidence that factory output is picking up. But enough of these hints; turn to the story for the full treatment.

He Wieldeth a Hot Quill

Back on July 15 when the subject of price increases was confusing everybody from Senator Kefauver to consumers of tin whistles, Editor Walt Campbell went into a huddle with himself and wrote an editorial which he called "Parable of the Prices." He said in effect what everybody believed: The seller should set the price for his goods, but he should sell first with quality and service. To compel attention, and to conform with the generally accepted compositional form of a parable, Walt reverted to a parody of the style employed with signal success by the translators of the King James version of the Scriptures.

His concluding remarks stirred everybody who read them. "So I say unto you, go ye forth and set prices that will return ye a profit that is fair but not exorbitant. And go forth and worketh to beat hell. And ye shall rejoice in your plenty, and thy neighbors shall rejoice with you."

By the middle of August, more than 9000 reprints of the editorial had been ordered; it was carried on news service wires, and scores of companies and publications had requested permission to reprint it.

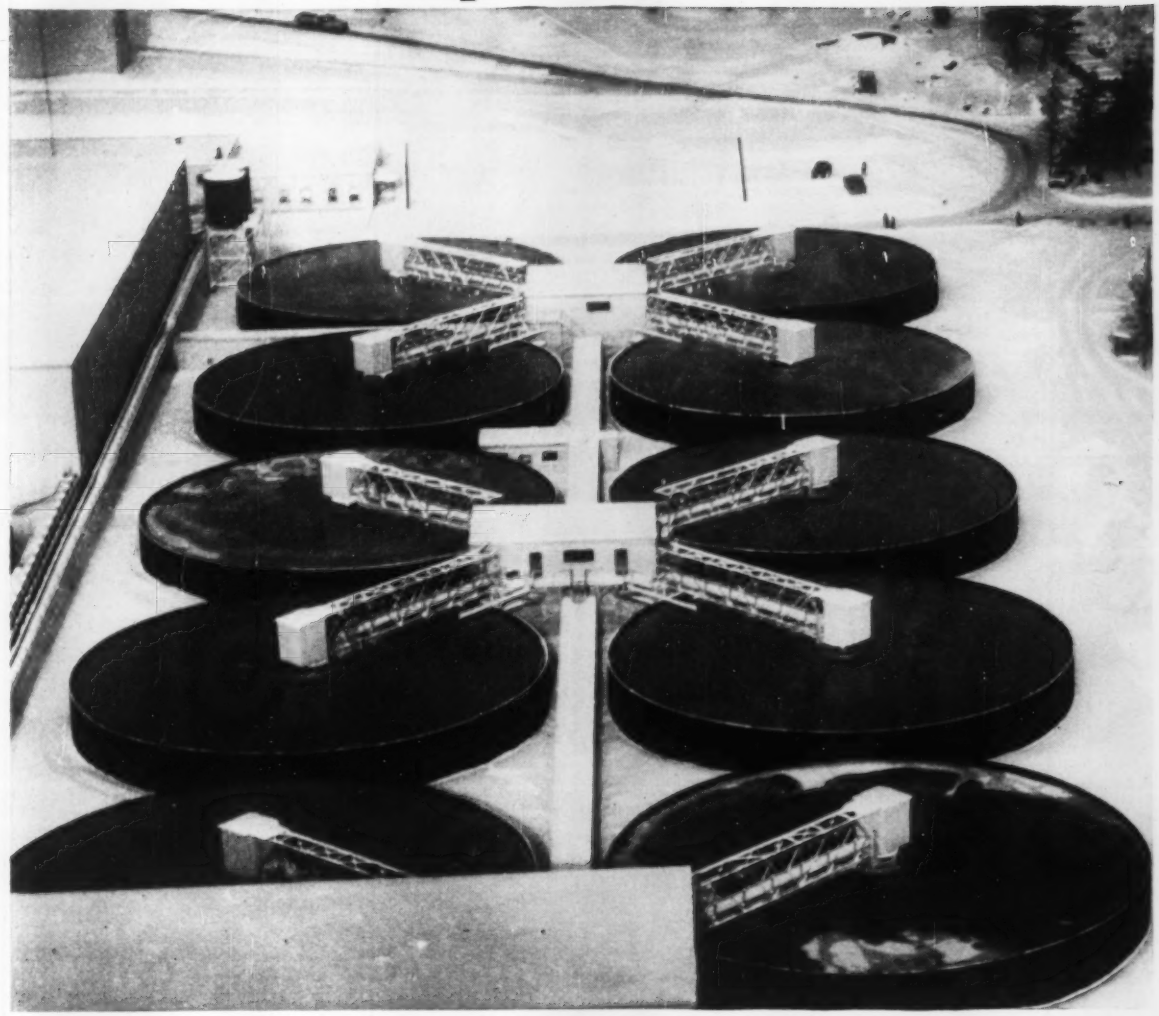
The Mail Goes Through

We shouldn't step into the controversy between the U. S. Post Office and publishers over the postal rate increase because our loyalty should lie with the publishers. However, in the battle to torpedo the hike, opponents declare that the post office wouldn't be in such sad shape if it didn't cling to outdated methods, and that's where we find ourselves a post office man. A Report of the Citizen's Advisory Council to the Post Office & Civil Service reveals that the post office maintains 135 horseback routes and 96 carriers who operate from shallow draft boats. Atomic age or not, we think that's mighty smart operating; it means that whether you're up a creek or up a draw, the U. S. Post Office will deliver your STEEL to you every Monday morning.

Shrdlu

(Metalworking Outlook—Page 57)

B.F.Goodrich report:



Uranium gets an acid bath

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those steel tanks are part of the above-ground operation of the world's largest uranium mines, located in Ontario, Canada. Over 100 huge tanks are used in the process of separating uranium from the ore. But the acids used are so corrosive they would eat holes in the tanks, pipes, fittings and valves.

What was done: B.F.Goodrich engineers recommended rubber lining by the exclusive B.F.Goodrich Vulcalock process. The rubber lining is locked to the metal so strongly and tightly that it practically becomes a part of the metal. A square inch of it can stand a 500 pound tug without breaking loose. Even if the acid-proof rubber is accidentally punctured, the Vulcalock bond confines the damage to a small area where it can easily be repaired.

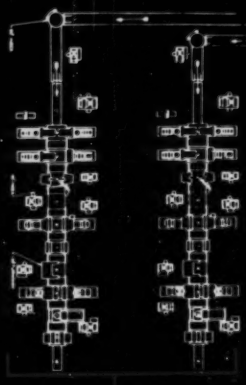
Extra benefits: This installation was lined in the field by specially-trained B.F.Goodrich craftsmen. It had to be finished quickly. Working at top speed, they lined over 100 tanks and miles of piping with 9½ acres of rubber.

Why specify B. F. Goodrich: Our tank-lining craftsmen have had a wide variety of experience in rubber-lining equipment in the field. Many of these jobs were big, spectacular; others were smaller, but all were handled efficiently due to the skill and ability gained by years of doing field work under difficult conditions. *B.F.Goodrich Industrial Products Co., Dept. M-170, Akron 18, Ohio, or Tuscaloosa, Alabama.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

1300 ft. Transfer-matic Performs 2291 Operations on V-8 Blocks



SECTION VI

Blocks enter with ends exposed. After tapping ends and top, they are rotated to car position for tapping banks and sides. Final position is bottom up for tapping pan rail and under banks.

SECTION V

Valve lifter holes are drilled, rough reamed, finish reamed and inspected.

SECTION IV

With blocks in car position, mounting pads are milled, cylinder head bank faces are drilled, chamfered and counterbored and deep oil holes are drilled.

SECTION III

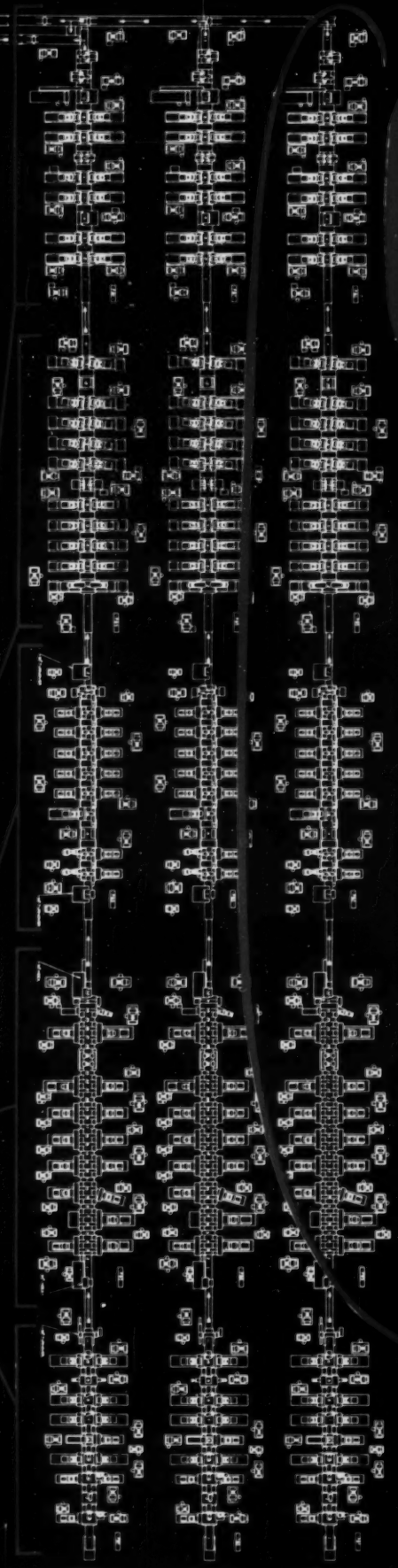
Blocks are turned on sides. Then distributor hole is rough and semi-finish bored, all holes in top are drilled and chamfered and crankshaft bearing cap holes and oil holes are drilled in bottom.

SECTION II

Blocks are turned 90 degrees, all holes in ends are drilled and chamfered, three oil gallery holes are pressure tested and cam shaft bearing diameters are rough bored. Then blocks are turned to car position.

SECTION I

Blocks enter bottom up. Oil pan screw holes are drilled, transfer spots are machined in pan rail, under banks are drilled and chamfered and blocks are turned to car position.



Here is the answer to the automobile industry's insistent request for machine tools which will reduce the cost of model changes and shorten change-over periods. This giant "Sectionized" Transfer-matic is constructed with an entirely new set of Cross building blocks and applies new concepts of standardization to machine bases, transfers, fixtures and heads.

- ★ Capacity to machine any passenger car engine block.
- ★ 270 stations in 17 sections, each with independent controls; sections operate automatically as blocks are made available; any section may be stopped without interrupting production of others.
- ★ 2291 operations on 185 blocks simultaneously.
- ★ Rated capacity of 350 cylinder blocks per hour.
- ★ Cross Machine Control Units with Toolometers for efficient tool programming.
- ★ Pre-set tools to reduce downtime.

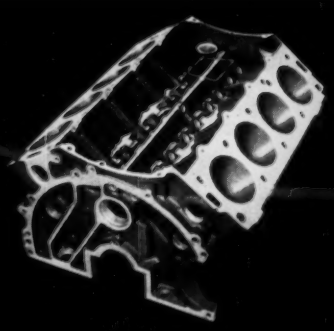


Photo shows
Sections II, III, IV
and V of Line A.

Established 1898

THE CROSS CO.

First in Automation

PARK GROVE STATION • DETROIT 5, MICHIGAN

Easiest, fastest way to kill fire...

KIDDE NEW DRY CHEMICAL EXTINGUISHER

Here – from Kidde – is the newest, the fastest, the easiest-to-operate dry chemical fire extinguisher!

Look at the extra large, aluminum handle and trigger – even a gloved hand fits comfortably with room to spare. Pick the unit up – it hangs straight – no awkward angle to throw you off balance.

If fire strikes, follow the simple directions: "Remove Horn" – automatically the trigger safety lock is released – "Pull Trigger" – instantly a cloud of fire-killing dry chemical whooshes out of the nozzle and fire's out! With this unit, designed by Kidde engineers working with Henry Dreyfuss personnel, you don't have to be a trained fireman to get perfect results.

Built for a lifetime of use, the handsome, new 20 and 30 pound Kidde dry chemical extinguishers have top ratings from Underwriters' Laboratories, require only 225-250 psi charging pressure. The rugged pressure gauge is recessed in handle for maximum protection. Tells at a glance if the unit is ready for use.

Available nationally through Kidde's sales and service organization. Write Kidde today for the name of nearest distributor.

Kidde

Walter Kidde & Company, Inc.
960 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal—Toronto

LETTERS TO THE EDITORS

Series: Well Done Job

I have been reading your Program for Management series with interest and congratulate you on a well done job. I would like a complete series for our people to read.

H. S. Valentine Jr.
Valentine-Radford Advertising
Kansas City, Mo.

Reader Wants Labor Pact Aid

Your Aug. 19 issue contains an article, "Make Your Labor Pact Work" (Page 118), in which we are interested. We would appreciate two copies.

A. W. Robertson
Plant Superintendent
Okonite Co.
North Brunswick, N. J.

Requests Two Articles

Please send two copies of your excellent articles, "Cold Treatment Ups Workability" (Page 93) and "Needed: More Marketers" (Page 66), in the Aug. 5 issue.

I have found these articles most interesting and would like to pass them on to others in our organization.

D. J. Parker
General Superintendent
Axle Div.
White Motor Co.
Cleveland

New Technology Described

We have read and enjoyed your Program for Management article, "Producing for the New Technology" (Aug. 12, Page 113), and feel it is quite informative. Please send 12 tear sheets.

S. E. Mueller
Sales Manager
Bonney-Floyd Co.
Columbus, Ohio

Manager Seeks Inflation Data

I enjoyed reading your interesting article, "What Causes Inflation?" (Aug. 5, Page 60), and would appreciate an extra copy.

Karl G. Nowak
Factory Superintendent
Fenwal Inc.
Ashland, Mass.

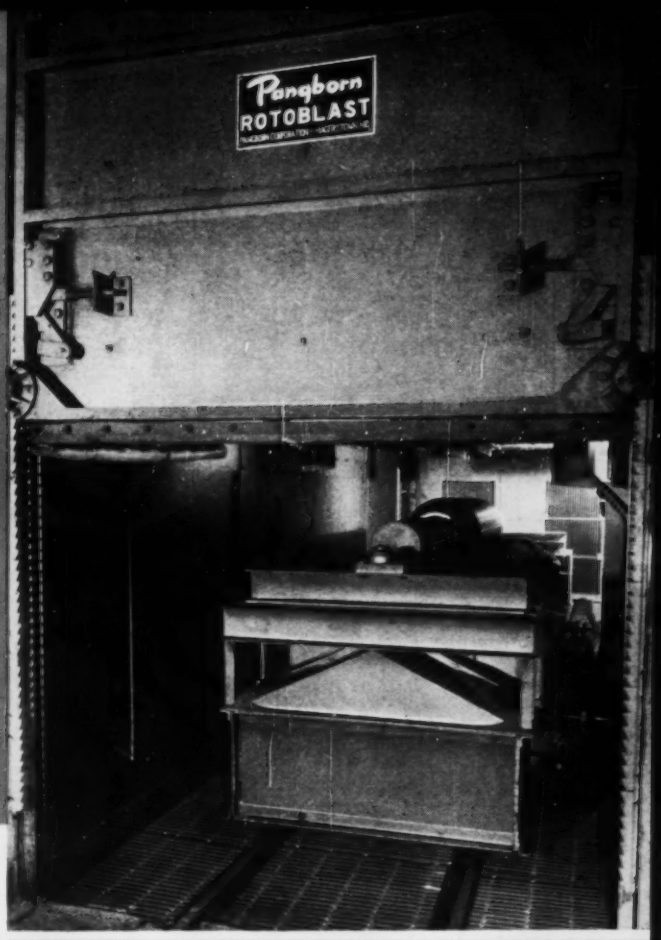
Article To Go Abroad

This office acts as agent for the International Co-operation Administration in carrying out certain phases of its technical program. In this connection, we have been asked by the U. S. Mission to the Organization for European Economic Co-Operation in Paris to provide material on the benefits of research.

We would appreciate permission to

(Please turn to Page 12)

Mill rolls etched twice as fast with Pangborn Rotoblast®



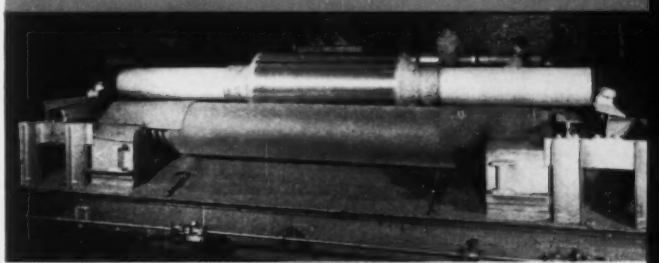
Faster and better . . . that's Pangborn's story for a leading steel producer. A year ago this mill replaced two air blast rooms—used for etching sheet machine rolls—with two Pangborn Rotoblast Roll Etching Machines.

According to management, these Pangborn Machines work *twice as fast* as the original equipment and do a much more uniform etching job. They are completely automatic and need no attention during operation. Furthermore, despite rough treatment 24 hours a day for the past year, these machines have required a minimum of maintenance.

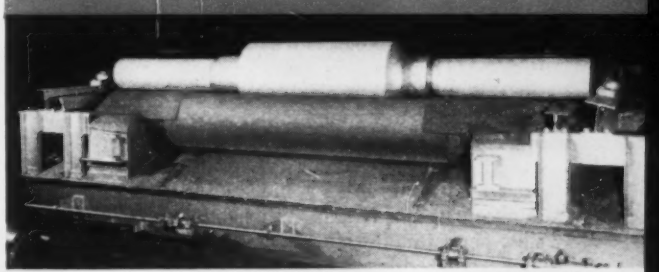
This installation represents another case where Pangborn Rotoblast solved an individual problem. If you have an unusual blast application, Pangborn offers a special service. Pangborn engineers will study your problem and its relation to your production line. Then they will design a machine for your particular needs. Find out how Pangborn's engineering service can give you better cleaning and faster production at lower cost.

Write today for Bulletin 610 to PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

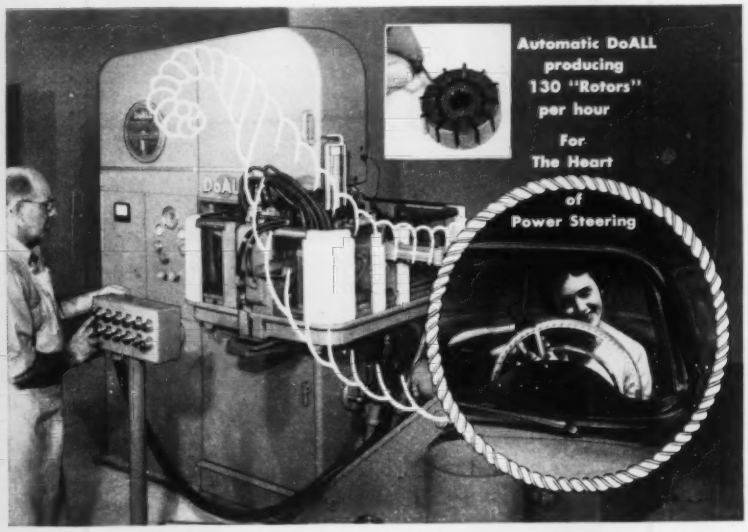
BEFORE ROLL ETCHING



AFTER ROLL ETCHING



Pangborn ROTOBLAST® cleans cheaper



Automatic bandsawing machine **indexes, slots and ejects 130 power steering pump rotors per hour.**

Cornucopia: 1957 Style

During the 10 years just past, the U.S. horn of plenty flowed more freely than ever before. Production increased an astounding 42%. The number of families owning homes jumped 38% . . . cars 60% . . . refrigerators 113%.

This growth occurred with but an 18% increase in employment. The catalyst? More and better tools that have increased human productivity by 19% since 1946.

Can such economic growth continue, with population increasing faster than the number of people available for employment? The answer lies in the extent to which industry invests in new tools to increase human productivity and reduce manufacturing costs.

The tools are available. The completely automatic band-sawing machine pictured above is an example. It slots rotors for automotive power steering mechanisms. The operator simply places the rotors in the loading chute. The machine automatically indexes, slots and ejects completed parts, three at a time. Production is more than twenty-one slots per minute. Labor cost is half that required with the previous machining method.

The application of band machining to high speed production of duplicate parts is an entirely new concept. It has been made possible by development of powerful, rigid, automatic machines . . . and new high speed steel saw bands which will cut up to ten times faster and last up to thirty times longer than those previously available. As a result, thousands of slotting, splitting, notching and cut-off jobs now can be done faster and cheaper than ever before.

In more widespread use of such improved tools lies the way to even greater abundance. Management, labor and government should be inseparable in pursuing this goal.

Advanced concepts of sawing, grinding, lapping and gaging are the particular contribution of The DoALL Company to increased human productivity. The company markets more than 1500 machine tool, cutting tool, gaging and supply items through a network of 38 sales-service stores. Information and machine demonstrations available upon request, without obligation. Call DoALL locally or write.

Reprints of this series on economics available for your employees.

INFORMATION and machine demonstrations available upon request, without obligation. Call DoALL locally or write.

The DoALL Company
Des Plaines, Illinois
38 Local Sales-Service Stores E-103N

LETTERS

(Concluded from Page 10)

use your Program for Management article, "Research . . . Threshold to the Future" (July 15, Page 93), in a bulletin on co-operative research activities to be issued by OEEC.

Saul Abrahams
General Industrial Section
Office of Technical Services
U. S. Department of Commerce
Washington

• *Permission granted.*

Interest Noted in Beryllium

We have noted with interest your article, "Beryllium Takes New Step" (Aug. 19, Page 152), and would appreciate 13 reprints.

L. C. Leavitt
Vice President
Otto Konigslow Mfg. Co.
Cleveland

Constructive Project

I would appreciate receiving a set of the articles published to date in your 1957 Program for Management. Your good publication is deserving of much credit for this extremely constructive and thought productive editorial project.

Kenton Chickering
General Sales Staff Manager
Oil Well Supply
Division of U.S. Steel Corp.
Dallas

Lauds Philosophy of Prices

We read with much enjoyment your editorial, "Parable of the Prices" (July 15, page 51), and think it is excellent. In effective language, it presents our own philosophy of prices. We would like 20 reprints for distribution to our salesmen.

C. G. Miller
Vice President
M. J. Crose Mfg. Co. Inc.
Tulsa, Okla.

Reader Questions Car Figure

In the Aug. 19 issue, we read your article, "UK Autos Hit All-Time Peak" (Page 117), with interest. However, I find it hard to believe that the production of 205,000 units could realize earnings of $617.4 million.

I would appreciate your comments on this.

L. A. Davis
Jamestown Electro Plating Works Inc.
Jamestown, N. Y.

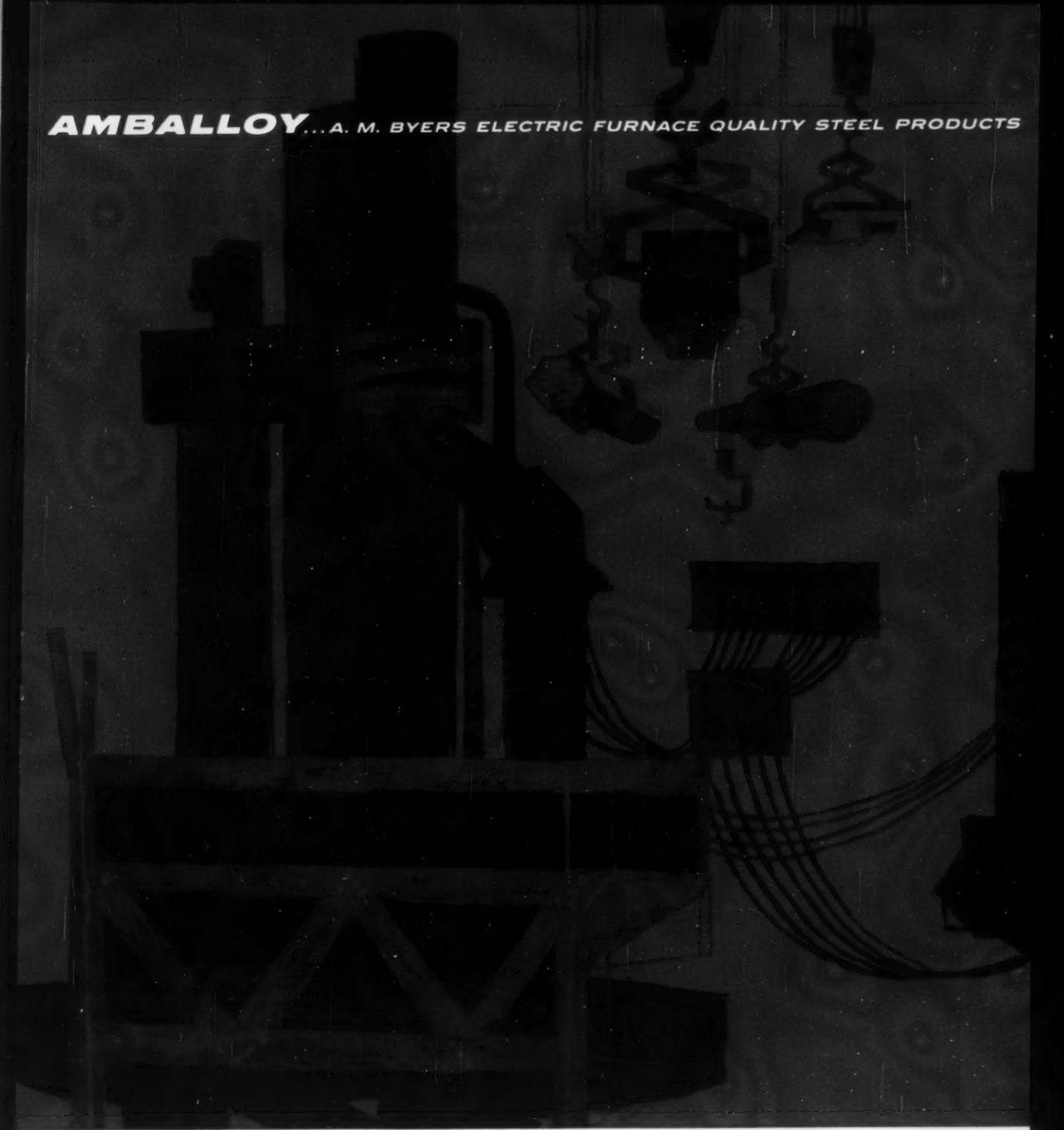
• *The earnings were realized from total automotive exports, including 205,000 passenger vehicles and an additional 117,000 units comprising trucks, commercial, and agricultural vehicles.*

Request for 3-Year-Old Article

Would you send two copies of the Program for Management article, "The Foremen—Make Them Managers" (Oct. 11, 1954, page 103)? I found the article to be most helpful. May we also have permission to reproduce it for distribution within our own plant?

John P. O'Connor
Industrial Relations Department
Shipbuilding Division
Bethlehem Steel Co.
Quincy, Mass.

• *Permission granted.*



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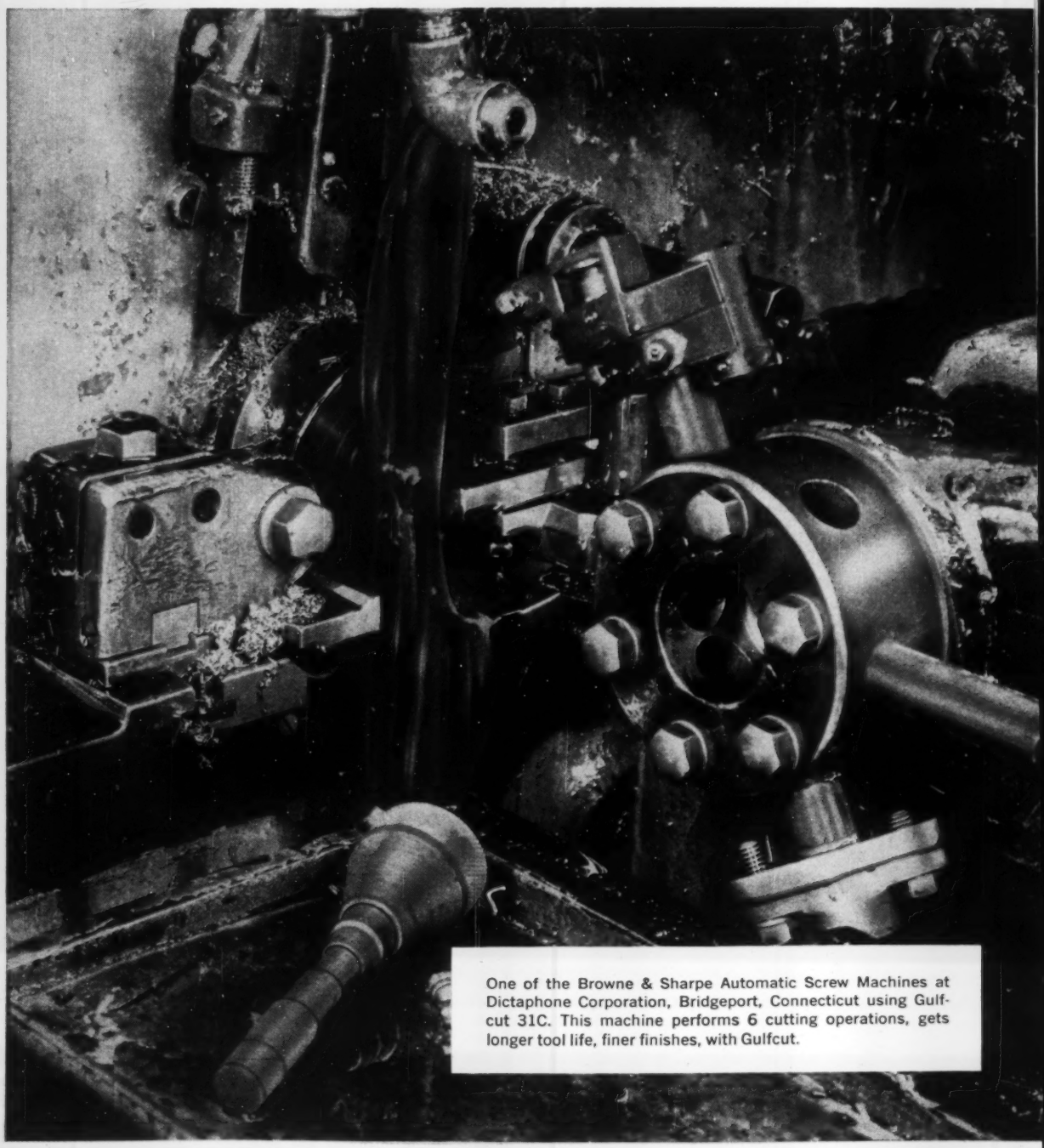
Ninety-three years of producing ferrous metals have familiarized us with many of your problems. So check Byers first for your steel requirements. Write for new catalog. A. M. BYERS COMPANY, Clark Building, Pittsburgh 22, Pennsylvania.

A growth company with the emphasis on quality and service **A. M. BYERS COMPANY**

At Dictaphone Corporation, Bridgeport, Connecticut . . .

Closer tolerances, better



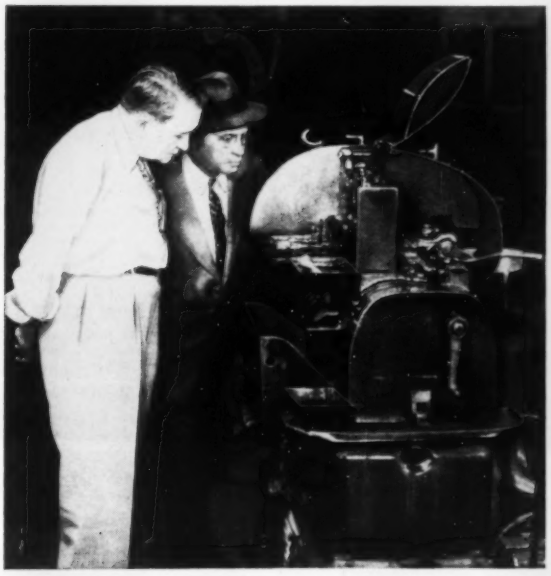
One of the Browne & Sharpe Automatic Screw Machines at Dictaphone Corporation, Bridgeport, Connecticut using Gulfcut 31C. This machine performs 6 cutting operations, gets longer tool life, finer finishes, with Gulfcut.

finishes, fewer rejects ...with GULFCUT!

Dictaphone has used Gulfcut 31C since Gulf first introduced this cutting oil—has used it exclusively for the past 10 years. On brass, bronze, aluminum, or any of the several types of steel used in manufacturing precision parts for Dictaphone Machines . . . *one* cutting oil, Gulfcut, does the job!

Says Joseph A. Maloney, Process Engineer: "Day in, day out, our machines are producing fine quality work, using Gulfcut. We get steady production at an even rate—hold tolerances as close as 3 ten thousandths. Gulfcut 31C provides the necessary combination of lubrication and cooling that leads to longer tool life, better finishes, with fewer rejects."

Whether you need a mineral-lard oil, a sulfurized-mineral oil, a sulfurized-mineral-lard oil, a sulfo-chlorinated-lard oil, or an emulsifying oil (the Gulfcut line includes all of these) . . . call your Gulf Sales Engineer. He will be glad to recommend the proper cutting oils for *your specific needs.*



Joseph A. Maloney, Process Engineer at Dictaphone, and J. A. Magill, Gulf Sales Engineer, observing Gulfcut 31C at work on precision parts. Gulfcut cutting oils excel over a wide range of cutting applications . . . help to reduce machining costs.

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1822 Gulf Building, Pittsburgh 30, Pa.

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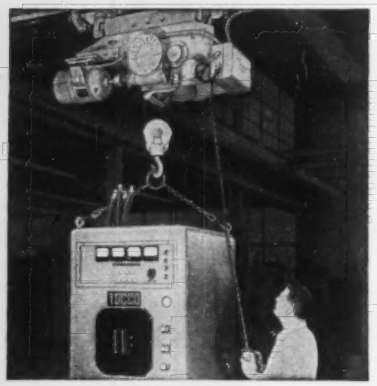

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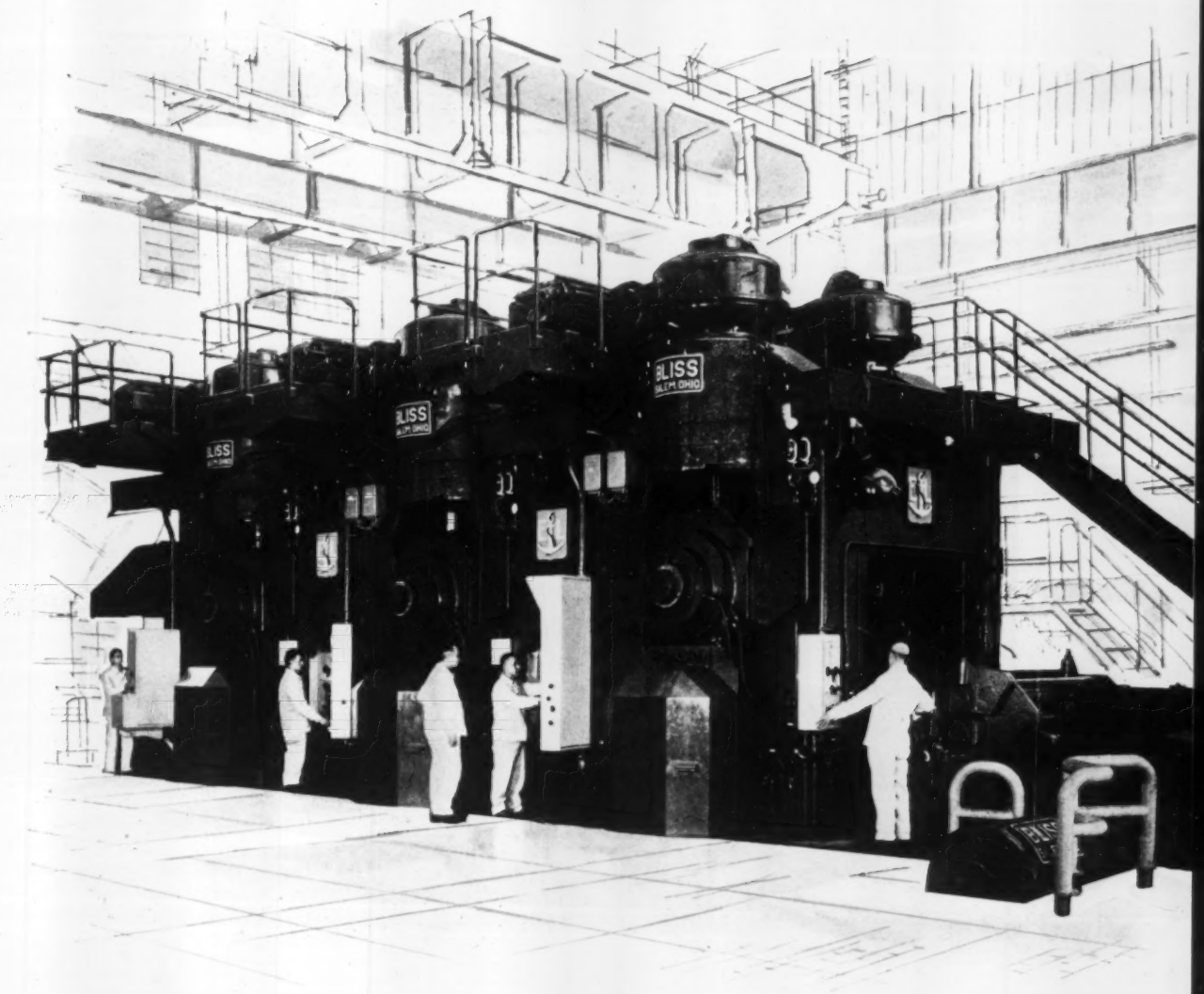

Espérance-Longdoz increases cold-rolling capacity with new Bliss mill

This 3-stand 4-high tandem mill at Ste. Ame. d'Espérance-Longdoz in Liège, Belgium is the first large multiple stand rolling mill in the Benelux countries. Built by Bliss' Rolling Mill Division, it rolls steel strip up to 52" wide from hot-rolled band down to thin cold-rolled strip. Mechanized entry and delivery equipment almost eliminate manual coil handling.

This modern cold reduction tandem mill is much more than ample for Espérance-Longdoz to convert its present 600,000-ton hot-rolled production. What's more, the mill is designed to allow later addition of a fourth stand.

This installation is a typical example of how Bliss engineers design a mill to meet a customer's particular rolling problem. For other examples, write for our 60-page Rolling Mill Brochure, Bulletin 40-A.

BLISS
SINCE 1857

100 years of making metal work for mankind

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

How do you keep rocketing at 8000 mph?

Courtesy: Resistoflex Corp., Roseland, N. J.

For one thing, you feed your rocket fuel – savagely corrosive stuff, like white and red fuming nitric acid. You use a fuel line of Teflon hose, wrapped in stainless wire braid – with special stainless steel fittings to make it stay put.

The fittings are swaged on – and listen to a few of the 19 test beatings they get. In an impulse test, with fluid temperature at 400° F., an impact of 4500 psi is applied, and reduced to zero in one second. The cycle is repeated 35 times a minute – for 100,000 cycles.

Another test, at 450° F., submits the hose and fittings to vibration at 2000 cycles per minute through ¾" lateral movement. This grueling test is applied for 200 hours . . . is followed by a severe high-pressure test to assure a leak-proof seal. It's hard on the fittings . . . but a positive test of durability.

Frasse has provided trouble-free stainless steel for this vital fitting application since its inception – and often supplied it *in hours*, to meet production deadlines. So, if you want reliability in your product, and a reliable source of supply . . . rely on Frasse for *all* your stainless requirements. It's a habit you'll find profitable.

Call FRASSE for COMPLETE STAINLESS STEEL SERVICE

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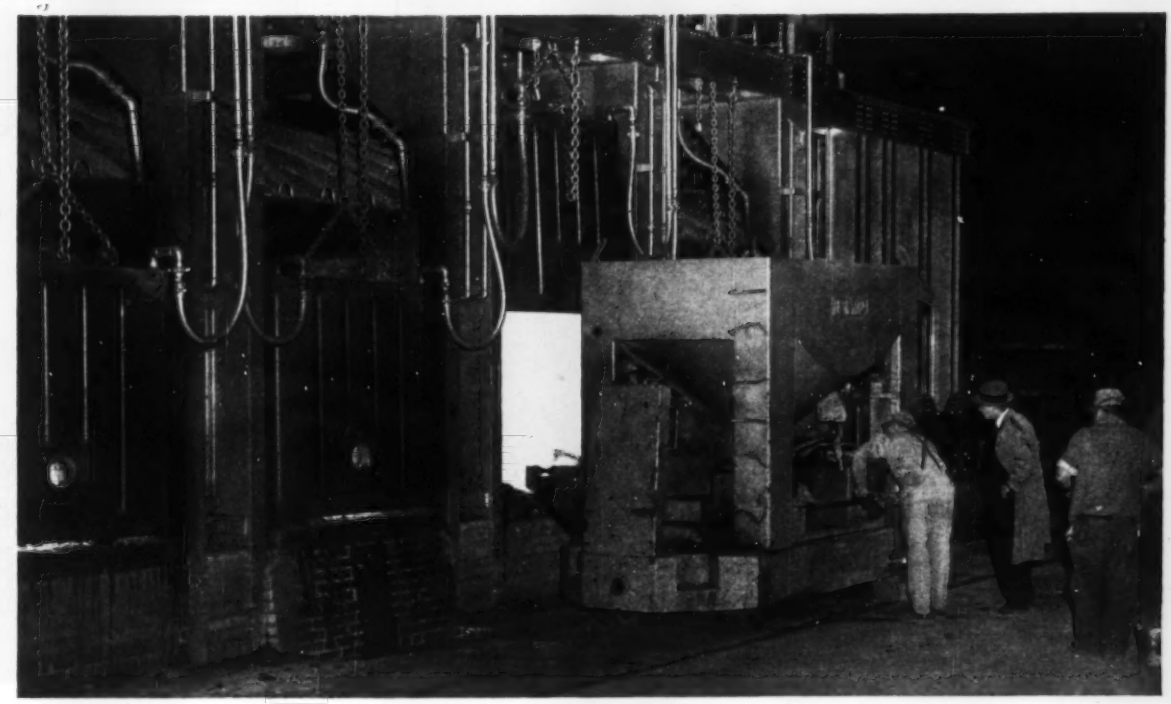

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To minimize furnace bottom troubles, specify Baker's Magdolite or Jebcolite, products that are always five ways better: in composition, preparation, strength, economy and quality.

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quality

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Dependability, increased payload, and improved performance . . . these are the outstanding features of the new Sikorsky S-58 commercial helicopter for transport service.

And you can say the same things about Morse *Electrolized* Tools, used in construction of the S-58. *Dependability* on the toughest jobs. *Increased payload* . . . because Morse *Electrolized* Tools last up to 100% longer. *Improved performance* . . . because every hole is smoothly and accurately drilled.

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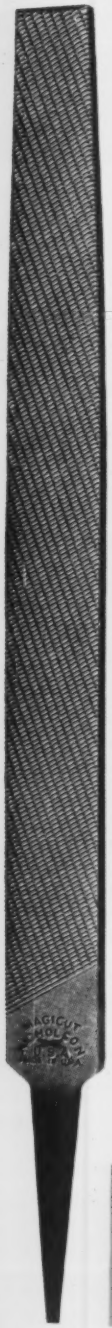
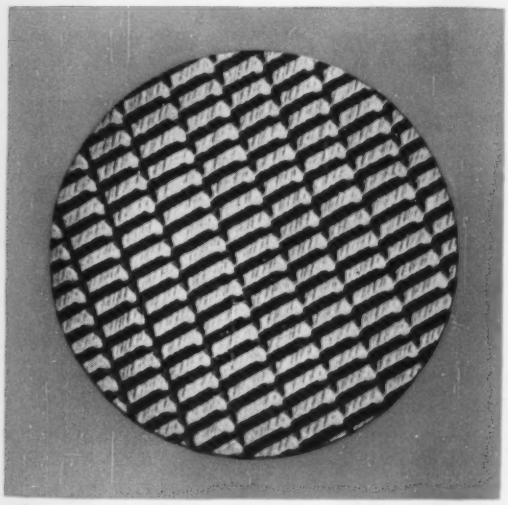
THE MOST EXCITING FILE NEWS IN YEARS!



Nicholson announces the new

MAGICUT ALL-PURPOSE MACHINIST'S FILE

with exclusive Penetrating Planer Type Teeth that rough... then smooth all metals in one stroke!



⬆ This is a close-up (enlarged) of the most efficient All-Purpose Machinist's file you can use. It's available *now* through your Industrial Distributor.

⬅ Note the unique pattern of narrow chip breakers created by steep-angled serrations. This *maximum* cutting surface design gives fast, deep penetration on all metals.

When it comes to file news, it's Nicholson that makes it! The news now is the Magicut—a great new Machinist's file.

The All-Purpose Magicut has a new kind of teeth—Penetrating Planer Type—to rough and smooth all industrial metals in one operation. This new tooth structure, created by Nicholson research, is *super*-efficient.

You'll like the exceptional versatility of the Magicut. You can use it on dense metals like brass and bronze . . . on other metals like annealed tool steel and malleable iron. The Magicut is an All-Purpose Machinist's file for everything from soft aluminum and lead to stainless steel. It comes in Flat, Half Round and Square shapes in 8-, 10-, 12- and 14-inch lengths.

Created by Nicholson researchers, made by Nicholson craftsmen, sold in Nicholson or Black Diamond brands, the Magicut is the most exciting file news in years!

In keeping with his policy of bringing you the newest and finest in equipment and tools, your Industrial Distributor now has the new Magicut file. Ask his representative to show it to you.

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NICHOLSON and BLACK DIAMOND FILES

A FILE FOR EVERY PURPOSE

CALENDAR
OF MEETINGS

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse Hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 11-14, National Metal Trades Association: Eastern plant management conference, Claridge Hotel, Atlantic City, N. J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress Hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-18, Electronics Industries Association: National technical machine tool automation meeting, Ambassador Hotel, Los Angeles, Calif. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 20, Malleable Founders' Society: Fall meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Associations Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D. C. Executive secretary: George T. Underwood.

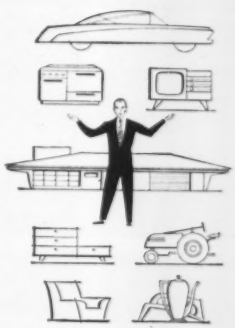
Sept. 23-25, American Society of Mechanical Engineers: Fall meeting, Hotel Statler, Hartford, Conn. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Sept. 23-26, Association of Iron & Steel Engineers: Annual convention, Penn Sheraton Hotel, Pittsburgh. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Sept. 26-27, American Hot Dip Galvanizers Association Inc.: Semiannual meeting, Netherland-Hilton Hotel, Cincinnati. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Sept. 29-Oct. 3, National Screw Machine Products Association: Fall membership meeting, Broadmoor Hotel, Colorado Springs, Colo. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Part of extensive Logan System in brass mill. Roller Conveyor loop serves as coil storage ahead of pickler served by Downender in foreground. Coils are fed to storage line by Vertical Reciprocating Conveyor at right.
DEMING CO.
DETROIT BRASS & MAL'BLE
DETROIT TRANSMISSION DIV.
DE VILBISS CO.
DEVOE & RAYNOLDS CO.
DODGE MOTORS DIV.
JOHN DOUGLASS CO.
E. I. DuPONT DE NEMOURS
DOW CHEMICAL CO.
D
EASTMAN KODAK CO.
ELECTRIC AUTO-LITE CO.
ELECTRIC STEEL CASTINGS
ELECTROLUX CORP.
EMERSON ELECTRIC
ESSO STANDARD OIL
EUREKA MFG. CO.
EVEREDY CO.
E
FAIRBANKS-MORSE
FARNSWORTH RADIO & TV
FIRESTONE TIRE & RUB.
FISHER BODY CORP.
FLEISCHMAN CO.
FLINTKOTE CO.
FORD MOTOR CO.
FRANKFORT DISTILLERY
(cont.)
F
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
The
LEADERS
use Logan



"Staying out in front" often is just as difficult as getting there in the first place. That is one of the reasons why America's leading industries depend on Logan Conveyors as an integral part of their productive processes. Speeding output, enlarging capacity, conserving manpower, and decreasing labor turnover are major Logan functions which you, too, can use to advantage. Write for nearest engineer or for further information.

LOGAN CO., 535 CABEL ST., LOUISVILLE 6, KY.

Logan Conveyors

INGENUITY

call KE for plant expansion or new facilities

Our most treasured ingredient at Kaiser Engineers is ingenuity. It manifests itself constantly in new, more efficient, and tested ways of designing and building our clients' plants.

Veteran KE engineers can take your facilities idea from a gleam in your eye through start-up. Or, they can perform any part of the project. One contract can cover all.

KE ingenuity—applied in fresh, daring ways since the start of contracting in 1914—can benefit your facilities. Investigate KE now!

STEEL

POWER

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has made KE a major engineer-contractor serving many industries

KAISER ENGINEERS

economic analysis • plant location • engineering • design
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Kaiser Engineers Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Sydney, Tokyo

4363

...lets one man handle work you'd pay a crew to do!

By putting new efficiency, safety and positive control into the hands of Towmotor lift truck operators you enable them to do a *bigger day's work, easier.* You let each one handle jobs you'd normally hire a *gang* to do.

Through modern Towmotor mass-handling each operator has the power to improve your profit picture, because the new Towmotor fork lift trucks multiply their productivity. Look over the new features that operators like best about our latest models—such as:

- New planned-comfort design
- Off-center adjustable seating
- Double action hydraulic tilt
- Newly-improved power steering
- "3-second access" to engine
- Famed 12" reach for all controls

Before you decide on your next fork lift truck, we urge you to get all the facts on the newly-designed Towmotor units. Write to Towmotor Corporation, Cleveland 10, Ohio today and ask for our new illustrated lift truck booklet—No. SP-23.

Leaders for 38 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR — THE ONE-MAN-GANG ® — GERLINGER

Gerlinger Carrier Company, Dallas, Oregon, is a subsidiary of Towmotor Corporation

Gusti

Your New Source of Aluminum—Coming to Life

Imaginative, energetic, experienced men . . . capably bringing to life a major new source of Aluminum—one with an initial annual capacity of 340 million pounds!

Their tools: vision, the benefit of more than 40 years of Olin Mathieson experience in producing non-ferrous metals, and an investment of $300 million.

Their goal: Quality and Service standards unique in the Aluminum industry.

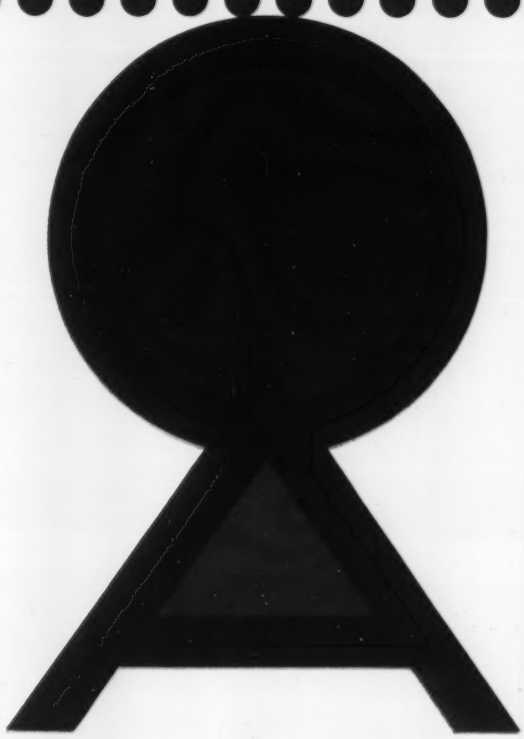
What do these new standards mean? Custom-Tailored Aluminum . . . with finishes and tolerances tailored specifically for you, to meet your individual production needs. Competitively superior Aluminum that will simplify your manufacturing operations and give you maximum output for each pound consumed. And with it: Outstanding Technical and Sales Service—the kind that values your continuing satisfaction as the most important criterion of success.

This is Olin Aluminum—growing and expanding to meet your needs.

For more information about Olin Aluminum, write: Aluminum Division—Sales, Olin Mathieson Chemical Corporation, 460 Park Avenue, New York 22, N. Y.

Ω AND "OLIN ALUMINUM" ARE TRADEMARKS

OLIN
ALUMINUM



Ω *Symbol of new Standards of Quality and Service in the Aluminum Industry*

R5000 Series Respirator

Solve Respiratory Problems Simply with

14 Respirators in One

(American Optical R5000 Series Respirator)

If your plant has two to fourteen respiratory hazards you *don't* have to buy two to fourteen different respirators! The AO R-5000 Series will give you quality protection against a multitude* of dust, mist, fume, and gas hazards (singly or in combination) at the cost of *just one* basic face piece and the necessary cartridges and filters. Quick interchangeability does it!

*Nuisance, toxic and pneumoconiosis-producing dusts, acid gases, organic vapors, alkali gases, metal fumes, radioactive particulate matter, pneumoconiosis-producing mists and ammonia.

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Always insist on Trademarked Safety Products. Your nearest American Optical Safety Products Representative can supply you.

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Branches in Principal Cities

SIMONDS SERVICE

the Extra Value behind Every

SIMONDS Segmental Saw!

Sure you get straighter cutting, smoother finish and greater satisfaction when you select Simonds Segmental Saws — with your choice of tongued or slotted segments. But you get a lot more!

You get fast, dependable service at Simonds Factory Branches from skilled Simonds servicemen who really know their business.

In Sharpening — Newest automatic sharpening machines operated by men who have an instinctive "feel" for the proper cutting edge combine to put "new life" in your favorite saws.

In Repairing — Specially designed equipment handles flattening, straightening, tensioning, riveting, and finish grinding.

In Re-segmenting — Specialists using the latest techniques and machines have the know-how to do any re-segmenting job quickly to your complete satisfaction.

For complete Segmental Saw Service send your saws to any of these Simonds Factory Branches: 1350 Columbia Road, Boston, Mass. • 3323 West Addison St., Chicago, Ill. • 228 First St., San Francisco, Calif. • 6500 N.E. Halsey St., Portland, Oregon.

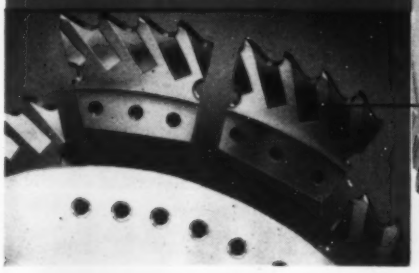
NOTE: Simonds Segmental Saws (either tongued or slotted type) are made of tough shock-resistant alloy steel saw plate with accurately fitted High Speed Steel toothed segments securely riveted to the rim. Saws are also available with carbide tipped segments for cutting aluminum and magnesium.

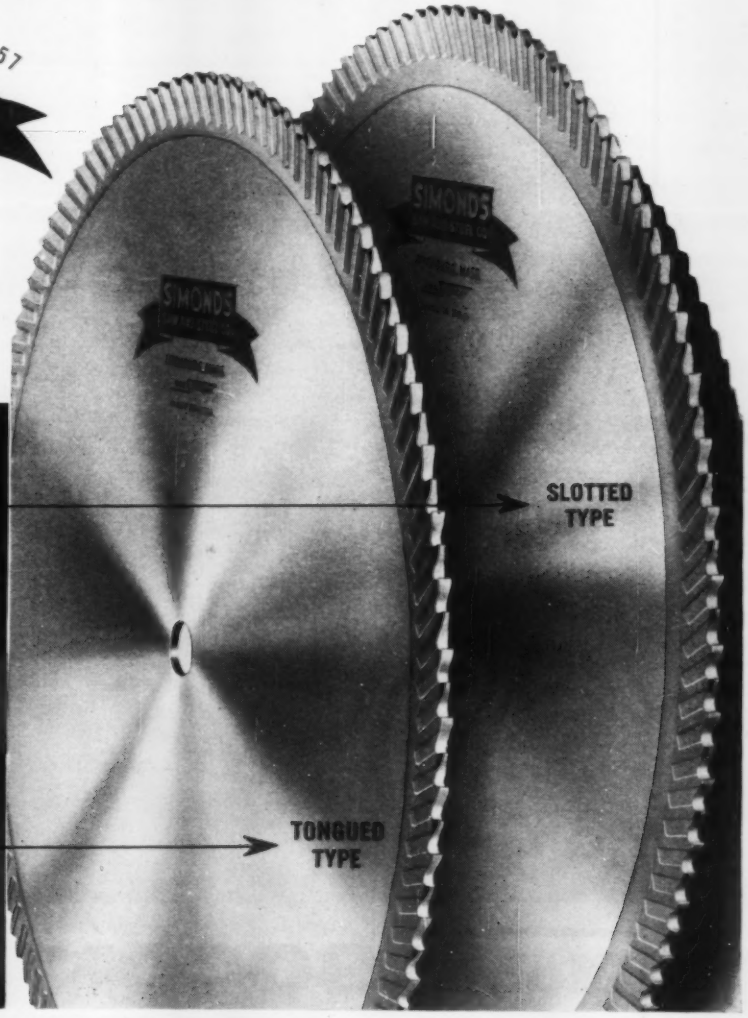
125 YEARS OF GROWTH • 1832-1957

SIMONDS SAW AND STEEL CO.

FITCHBURG, MASS.

SIMONDS SERVICE INCLUDES
SHARPENING, RE-SEGMENTING AND REPAIRING
BOTH TYPES

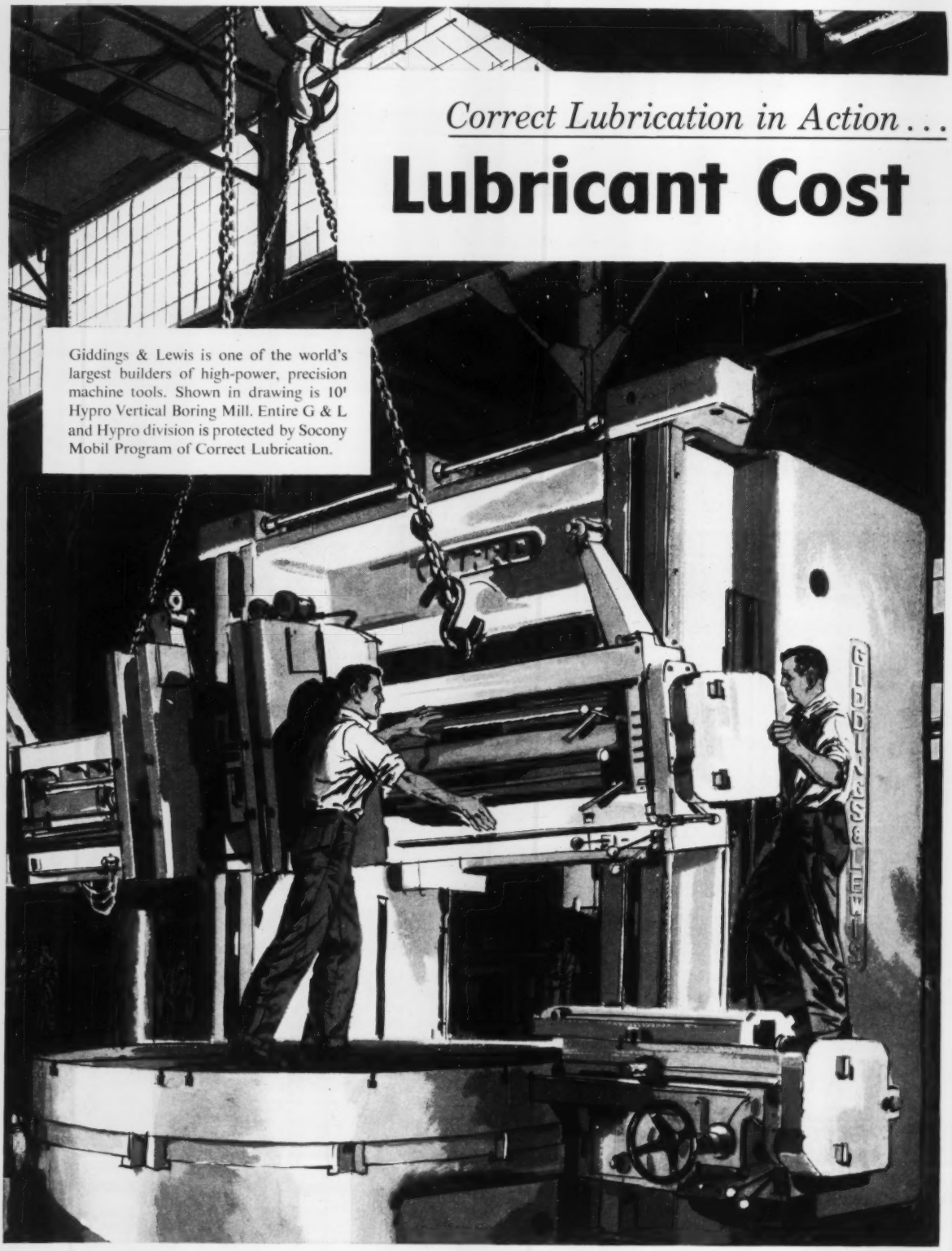




Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

Correct Lubrication in Action . . .

Lubricant Cost



Giddings & Lewis is one of the world's largest builders of high-power, precision machine tools. Shown in drawing is 10' Hypro Vertical Boring Mill. Entire G & L and Hypro division is protected by Socony Mobil Program of Correct Lubrication.

Mobil **SOCONY MOBIL**

Leader in Lubrication for over 91 years

in the **Machine Tool Industry**

Per Machine Cut 18%

One of many ways Giddings & Lewis Machine Tool Company has increased profits with the help of Socony Mobil

To Giddings & Lewis, one of the most direct ways to increase net profits is to reduce maintenance costs. That's why this company, a leading builder of quality, high-precision machine tools, relies on a Mobil Program of Correct Lubrication.

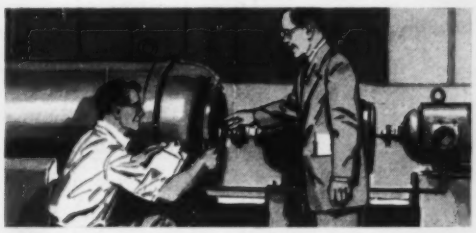
In just three years a Mobil "team" of lubrication specialists, working closely with plant personnel, cut lubricant costs per machine 17.9% . . . reduced lubricant application cost 7.6%.

These savings were but a few of the many and varied cost-cuts achieved through Mobil products and Mobil service. They reflect the many hours spent by Socony Mobil field and laboratory personnel in studying machine operations, preparing technical reports, making analyses of products in use.

Why not rely on a Mobil *Program of Correct Lubrication* to help *you* improve production and reduce maintenance costs?

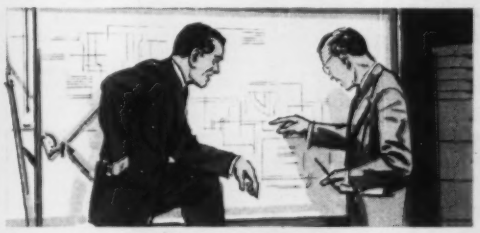
Can you afford to accept less than a cost-cutting service like this?

After a Mobil representative makes a lubrication analysis of your plant, a program of Correct Lubrication is put into action. Described below are some of the features of this program and how they benefited Giddings & Lewis.



Lubrication specialists, the most experienced in the petroleum industry, are ready to help you solve the knottiest lubrication problem. **For example, a Mobil engineer helped G & L solve a problem of repeated bearing failures on shop planers. His lubricant recommendation eliminated the trouble . . . saved $244 a year on each planer.**

Constant Quality Checks are kept on Mobil lubricants in use. Socony Mobil offers more analytical service than any other oil company. As a result, you can *safely* get maximum life from every Mobil product. **At the G & L and Hypro division Mobil quality oils are repeatedly filtered and put back to work. Periodic checks by Mobil laboratory analyses show oils to be in "like new" condition even after years of service.**



Thorough knowledge of machine design—Mobil engineers work closely with designers and builders . . . advise on hydraulic and lubrication system design . . . suggest the correct products for each machine. **G & L affixes a lubrication plate to every machine they produce. It specifies the use of the right Mobil product (or equivalent quality) to assure satisfactory operation wherever these machines are used.**

In-plant training clinics are conducted by Mobil engineers. Maintenance personnel are instructed in proper application procedures . . . taught to recognize trouble before it occurs. **At G & L, frequent electric motor failures were found to be caused by over-application of grease. Instruction corrected this trouble . . . reduced application time by 66% . . . cut grease consumption, too.**

Correct Lubrication

A proved program to reduce maintenance costs

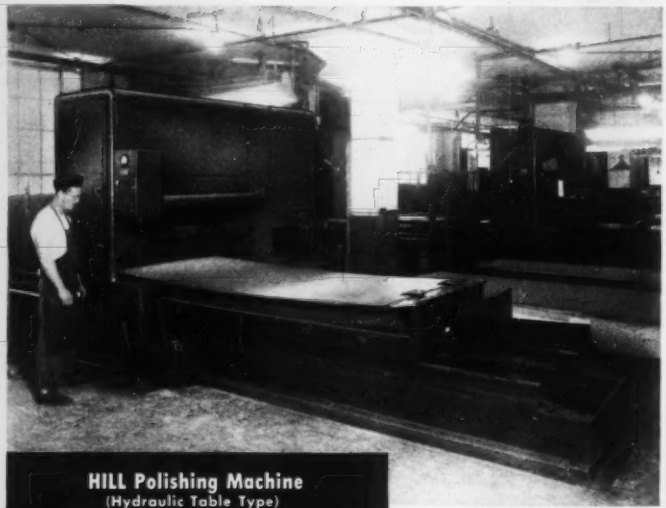
SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.

HILL GRINDING AND POLISHING MACHINES

For FINISHING

Any and All

FERROUS and NON-FERROUS MATERIALS . . .



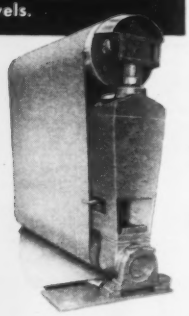
HILL Polishing Machine
(Hydraulic Table Type)
For polishing individual sheets and plates. Hydraulic reciprocating table with centralized controls.

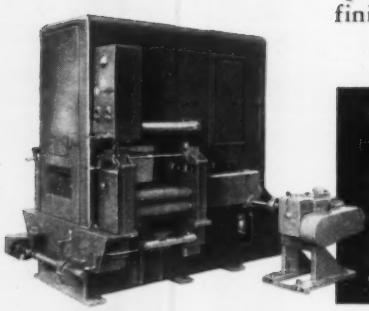
FLAT surfaces of ferrous or non-ferrous material can be brought quickly to the high finish so necessary for today's industrial and consumer products. The dairy, automotive, home appliance and engraving industries are typical of the wide range of application for these precise, labor saving machines.

HILL abrasive belt grinding and polishing machines are built in two general types. The hydraulic reciprocating table type polished individual sheets and plates. Table widths vary from 36″ to 60″. Table lengths range from 60″ to 240″. The Pinch-Roll type is for progressive line polishing. The HILL two-roll vertical head with endless abrasive belt is the basic principle common to both types.

When writing for information please indicate size and specifications of stock to be finished.

The basic HILL two-roll vertical head with upper steel idler roll and lower rubber covered contact or work roll (both dynamically balanced) over which the endless abrasive belt travels.





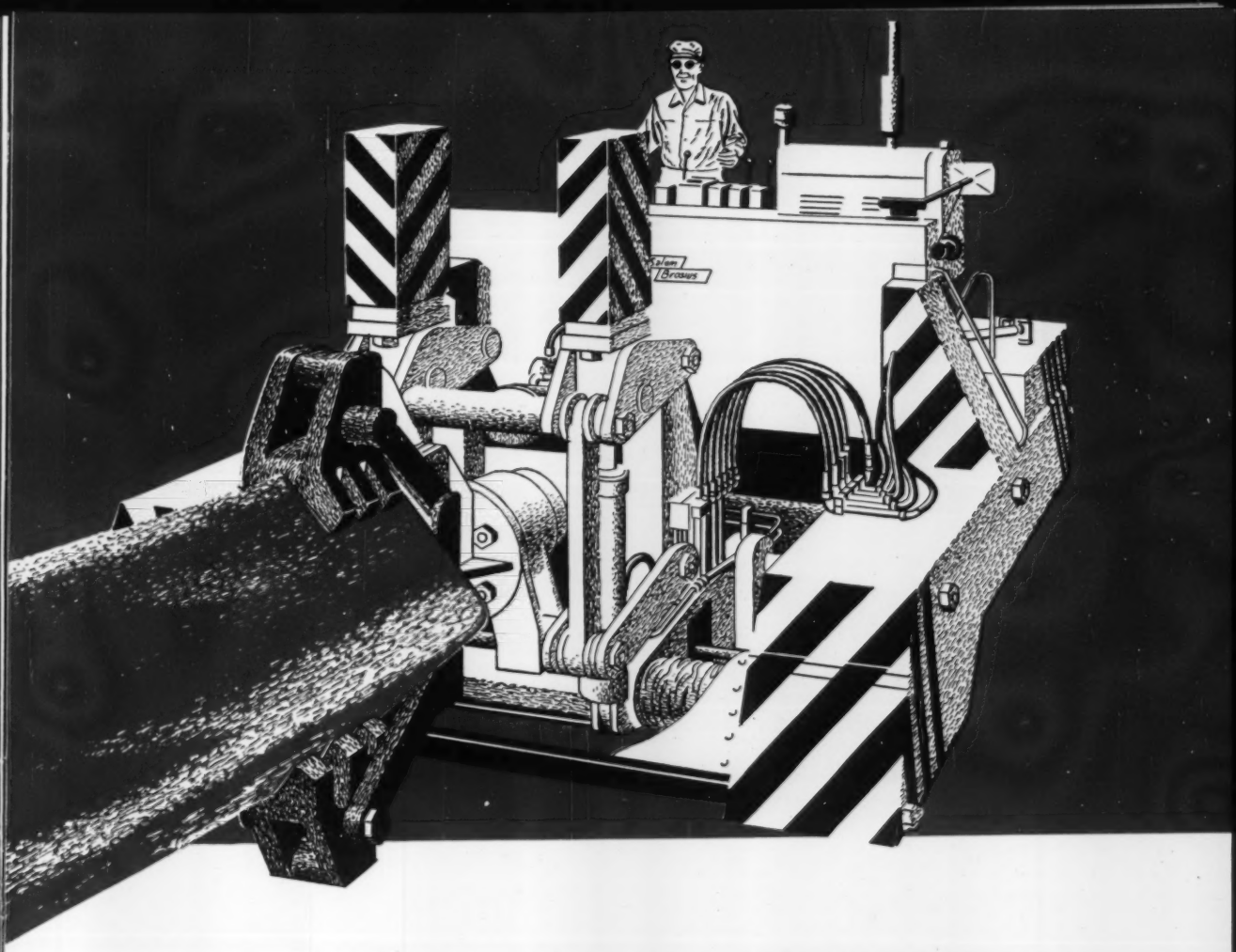
HILL Grinding and Polishing Machine
(Pinch-roll Type)
For pre-finishing, conditioning and polishing. Used as single units or in multiple units for progressive line polishing in wet or dry operations.

HILL ACME TOOLS FOR INDUSTRY

THE HILL ACME COMPANY

HILL DIVISION
ESTABLISHED 1882
1201 West 65th Street • Cleveland 2, Ohio

"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES



New Salem-Brosius Manipulator

adds speed, safety and economy to heavy forging

This completely new Salem-Brosius all-hydraulic Auto-Floor Manipulator meets the trend of industry toward hammer and press forging of high alloy, stainless, and tool steels, and the many new extremely hard refractory-type alloys. The forging of these metals necessitates manipulating equipment of extreme ruggedness and durability.

This new machine, with its greater mass, new shock absorbing principles, heavier construction, and a new and superior hydraulic system, offers long, trouble-free service, low-cost maintenance, and increased finished forging production.

At hammer or press it raises, lowers, tilts, rotates or laterally moves the hot stock, satisfying handling requirements. Also, it can charge or draw forge shop furnaces, and operate with the facility of a fork-lift truck in billet handling. Call for a visit from a Salem-Brosius forging expert to show you how you can benefit from the use of this manipulator. There is no obligation.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited • 1525 Bloor Street West, Toronto 9, Ontario

SPECIAL MECHANICAL EQUIPMENT • INDUSTRIAL HEATING FURNACES • MATERIALS HANDLING EQUIPMENT

In carrier landings, planes coming in at more than 100 knots are stopped in a split second. This amazing performance is made possible by having each plane hook onto one of several wire ropes stretched across the flight deck. Both plane and rope receive an almost unbelievable shock at the moment of contact. Needless to say, only top-quality wire ropes can be used for this application because . . .

you can't bargain with safety

While your use of wire rope differs from this carrier application, *safety should be just as important to you.* For, although a "bargain" rope may save you money, it can cost you your peace of mind. So don't bargain with safety. Buy a rope that's a *quality* rope—buy Wickwire Rope. 5049

WICKWIRE ROPE — A CF&I PRODUCT

CF&I

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
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NEWS FROM HAMILTON!

100 to 300 ton press line sets new standards

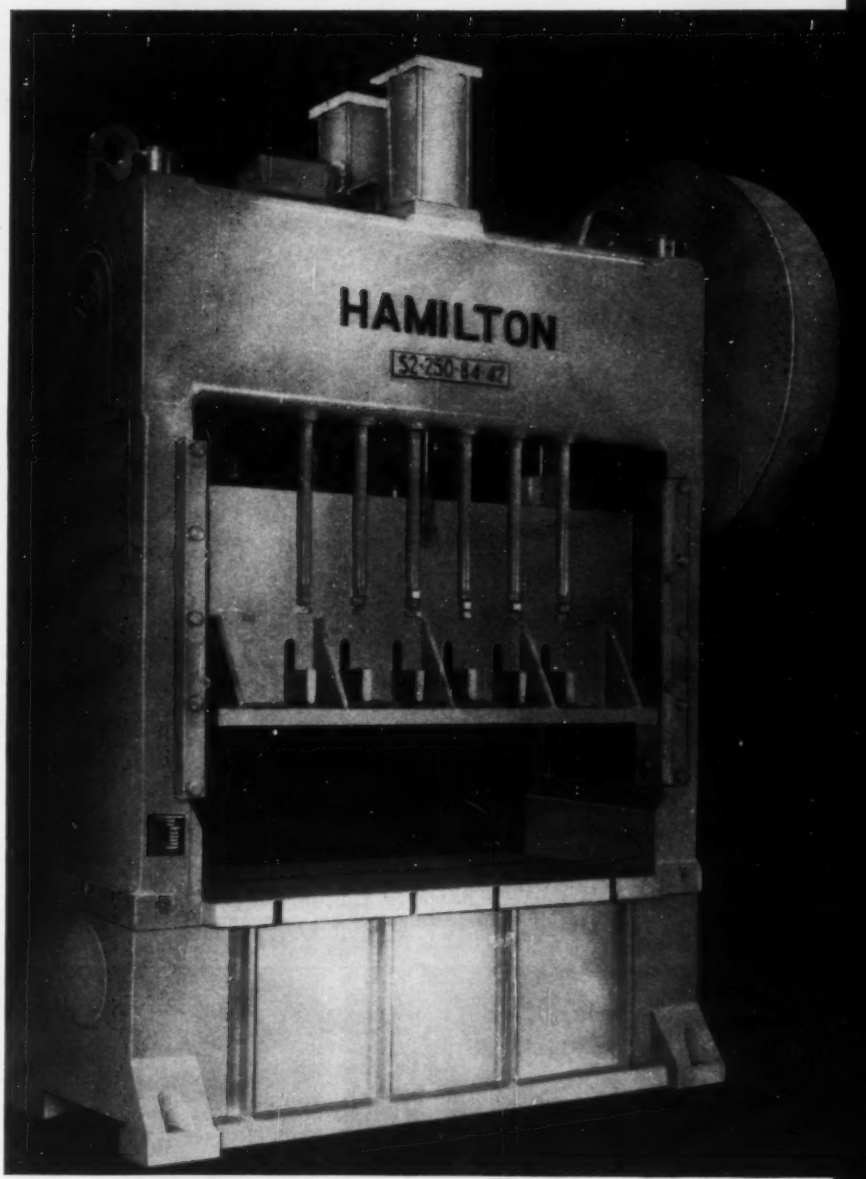
Hamilton offers you 100 to 300 ton presses built to meet exacting automotive production standards . . . standards pioneered in the automotive field through more than 30 years of Hamilton's leadership in building presses.

Every one of these 2 point, single acting, straight-side, double-crank presses is a brand new design. Each is engineered for constant top-speed, top-quality production — without profit-robbing downtime. Each is built for complete operating flexibility. Here are a few of Hamilton's design features that will mean more efficient operation for *you:*

- **mechanically interlocked air clutch and brake**
- **barrel-type motorized slide adjustment**
- **automatic lubrication**
- **pneumatic flywheel brake**
- **die lights**
- **die cushions**
- **pneumatic counterbalances**
- **interlocked electrical clutch control**

Exact specifications are adjustable to your individual requirements. Special electrical controls are available to meet particular electrical standards.

It will mean money in your pocket to find out today how these all-new Hamilton presses can help you turn out high quality stampings fast . . . without costly production downtime. Get the full story on these new 100 to 300 ton presses . . . from Hamilton Division, B-L-H Corporation, Hamilton, Ohio.



Hamilton's brand-new 250 ton double-crank press with 84 x 42 in. bed and slide.

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

BALDWIN BLH LIMA-HAMILTON

Here N-A-X FINEGRAIN *steel proves its versatility, forming readily under the deep-drawing operation that pressure cylinder manufacturing requires. For 20-lb. cylinders, .086"* N-A-X FINEGRAIN *blanks, 21¼" in diameter, become 12" in diameter and 7½" in depth after the drawing operation. Steel Cooperage Division produces cylinders up to 425-pound capacity.*

Submerged arc welding operation joins the two cylinder sections together. N-A-X FINEGRAIN *again demonstrates its weldability under any process.*

Here cylinder pressure capacities are tested hydrostatically at 480 lbs. psi, after the fittings have been added. Final burst pressure—1650 lbs. psi.

Finished product on the job. This cylinder, meeting all specifications of I.C.C. code, Section 4BA, contains liquefied petroleum for materials handling truck.

For whatever you make . . .

N-A-X® FINEGRAIN STEEL BUILDS IN STRENGTH WITH LIGHT WEIGHT

A significant example of the strength, formability and weldability of N-A-X FINEGRAIN steel is to be found in the manufacture of liquefied petroleum gas cylinders by Steel Cooperage Division of the Serrick Corporation, Detroit.

These lightweight LP-Gas cylinders must be able to withstand high internal pressures. Therefore, the steel used in their manufacture must have a minimum yield strength of 50,000 pounds per square inch and a tensile strength of 70,000 pounds per square inch, in order to meet the requirements of Section 4BA of the I.C.C. specifications.

On this job, as with so many others, N-A-X FINEGRAIN steel resulted in lighter weight, without sacrifice of strength and safety.

Check these important advantages for your job: N-A-X FINEGRAIN steel, compared with carbon steel, is 50% stronger • has high fatigue life with great toughness • is stable against aging • has greater resistance to abrasion • is readily welded by any process • offers greater paint adhesion • polishes to a high luster at minimum cost. And the physical properties of N-A-X FINEGRAIN are inherent in the "as rolled" condition. N-A-X FINEGRAIN'S resistance to normal atmospheric corrosion is twice that of carbon structural steel. NOTE: Where greater resistance to extreme atmospheric corrosion is an important factor, our N-A-X HIGH-TENSILE is recommended.

For whatever you make, from pressure cylinders to tractors, with N-A-X HIGH-STRENGTH steels you can design longer life, and/or less weight, and economy, into your products. Let us show you how.

N-A-X HIGH-STRENGTH STEELS

N-A-X Alloy Division, Dept. B-5

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

N-A-X Alloy Div., Dept. B-5

Great Lakes Steel Corp., Detroit 29, Michigan

☐ Please send me technical data on N-A-X FINEGRAIN steel.

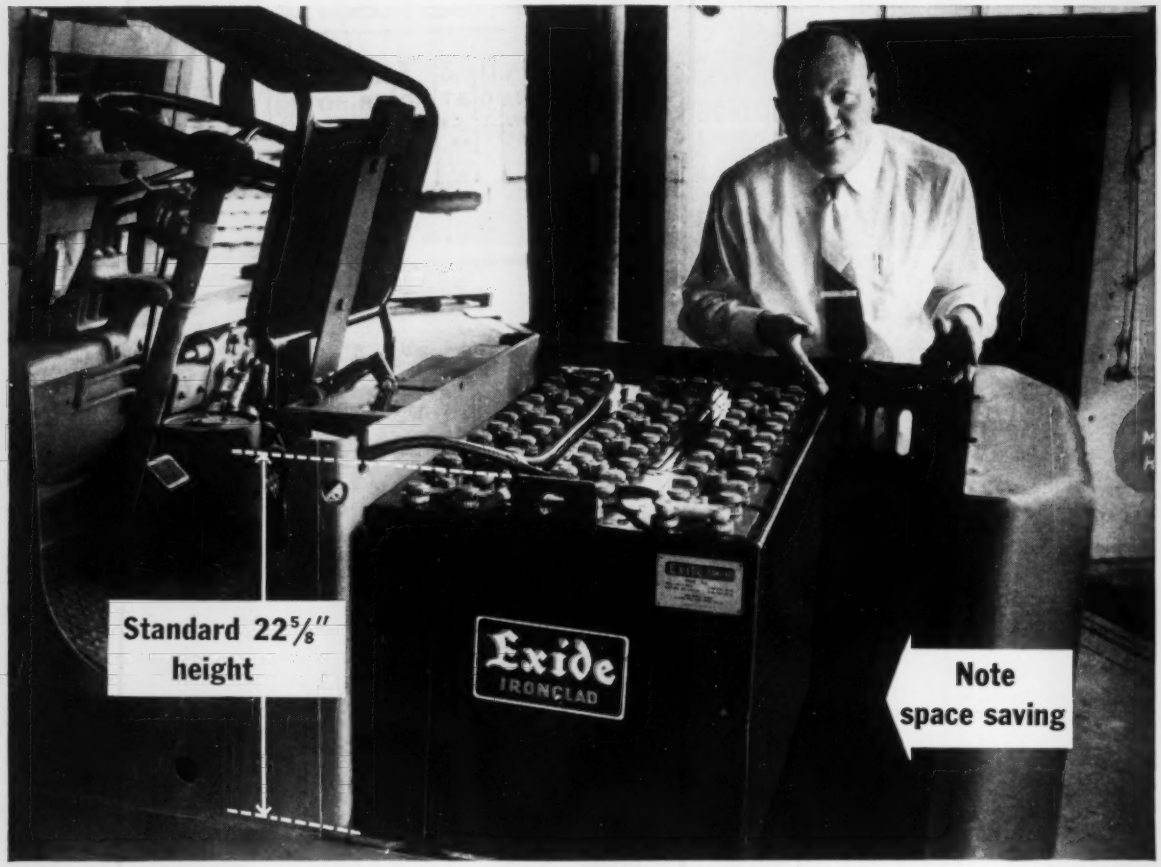
☐ Please have your representative contact me.

Name_____ Title_____

Company_____

Street_____

City_____ Zone____ State_____



Greater flexibility. A 5000 lb. capacity truck with a 648 amp-hr new TG Exide-Ironclad battery. Same truck could hold a 936 amp-hr battery for increased work capacity if needed. Or the 648 amp-hr battery could also be used on a truck as small as 2000 lb. capacity. This flexibility is possible only with Exide's exclusive new TG battery.

NEW TG EXIDE-IRONCLAD BATTERY PACKS SAME POWER IN SMALLER SIZE FOR LOWER COST

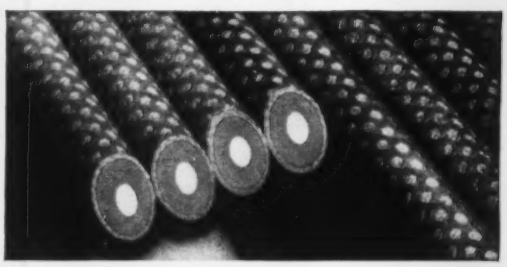
Improved design gives more power and life per dollar. Superior peak-load performance.

Here's the kind of battery economy that really counts: more power and life per dollar. The TG Exide-Ironclad is the most advanced and economical battery ever built for electric industrial trucks.

Every plate packs more power; fewer plates are required to perform a given duty cycle. That means you get a more compact battery with the *standard 22⅝ in. height*. It also means that, for a given capacity, the new TG costs you less. TG's armored porous tubing prevents practically any loss of active material; so even greater economy is gained as a result of its long, dependable service life.

More work from your trucks. The compactness of the TG means you can install more power in your trucks—thus, get more work from them. For a given size truck, TG can give you up to 44% more power than batteries you might otherwise use.

Only Exide offers you so much. When you order new batteries, get all the power, performance and life your dollar can buy. Get TG EXIDE-IRONCLAD. For full particulars about the extra productivity and longer life of the new battery, call your EXIDE Sales Engineer, or write Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.



New, more porous armored tubing for positive plate. Eases current flow. Holds more active material. Boosts battery power. Corrosion resistant Silvium* grid insures long plate life.

*Exide's patented grid alloy

Exide®

THE ELECTRIC STORAGE BATTERY COMPANY

B-RIGHT-ON®

SOCKET SCREW PRODUCTS

always measure up!

QUALITY B-RIGHT-ON® PRODUCTS

Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

Write for descriptive literature . . . see how

YOU CAN DO BETTER WITH B-RIGHT-ON.

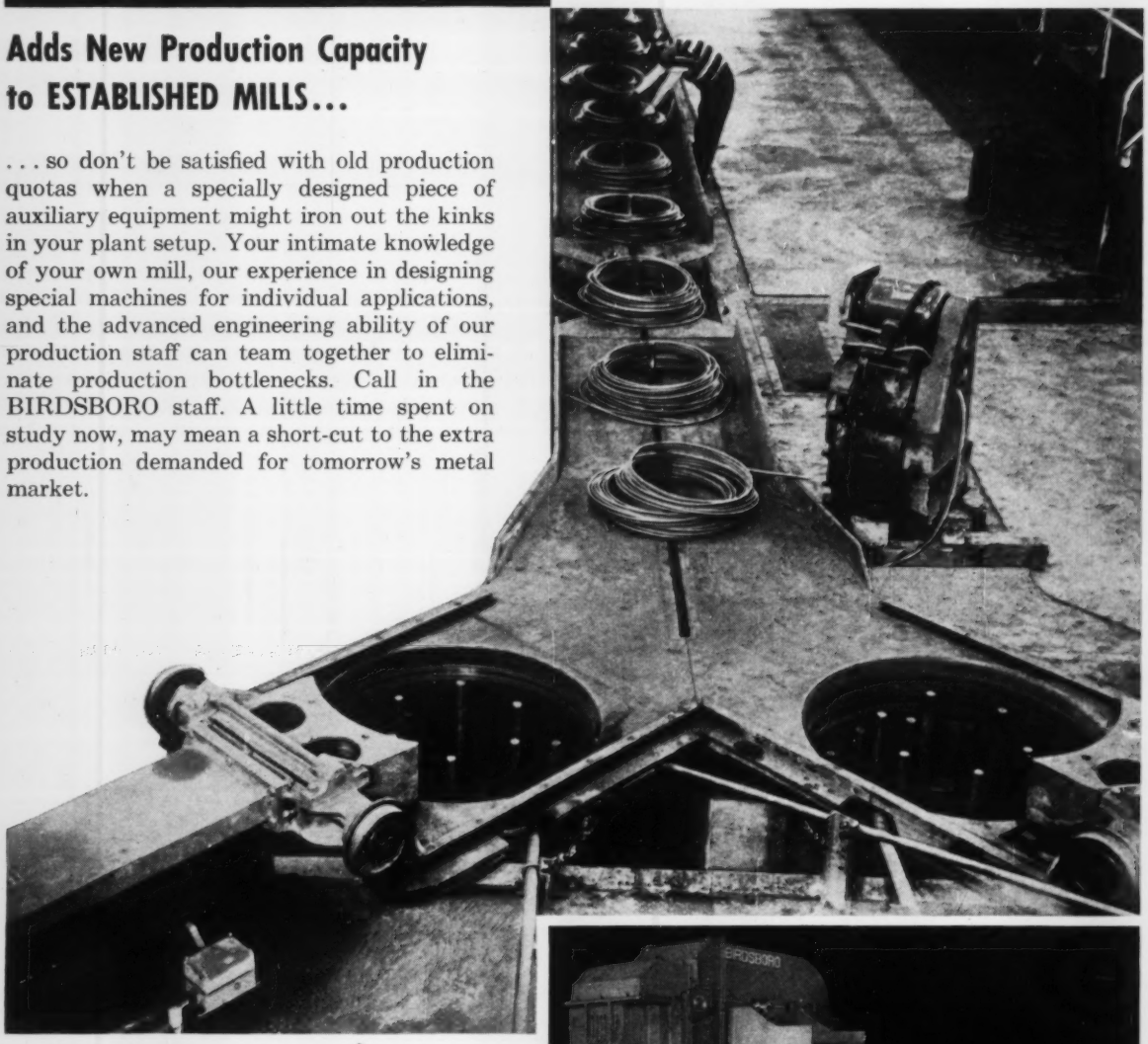
THE BRIGHTON SCREW & MANUFACTURING CO.

1835 READING ROAD CINCINNATI 2, OHIO

BIRDSBORO Auxiliary Mill Equipment

Adds New Production Capacity to ESTABLISHED MILLS...

. . . so don't be satisfied with old production quotas when a specially designed piece of auxiliary equipment might iron out the kinks in your plant setup. Your intimate knowledge of your own mill, our experience in designing special machines for individual applications, and the advanced engineering ability of our production staff can team together to eliminate production bottlenecks. Call in the BIRDSBORO staff. A little time spent on study now, may mean a short-cut to the extra production demanded for tomorrow's metal market.

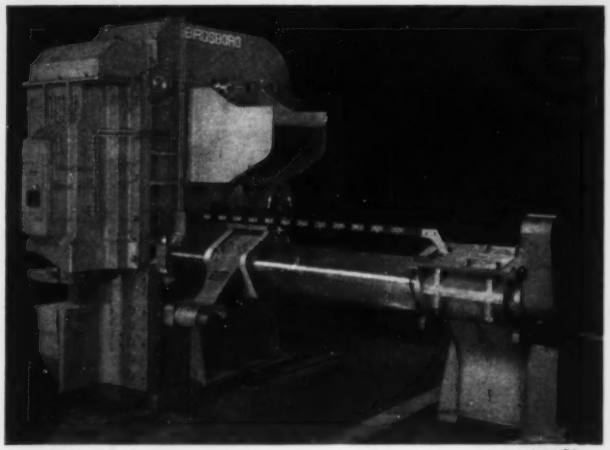


DESIGNERS AND BUILDERS OF:

- STEEL MILL MACHINERY
- HYDRAULIC PRESSES *(Metalworking and Extrusion)*
- CRUSHING MACHINERY
- SPECIAL MACHINERY
- STEEL CASTINGS
- Weldments "CAST-WELD" Design
- ROLLS: Steel, Alloy Iron, Alloy Steel

20"-18"-14"-12"-10" Combination Mill Rod Coilers and Rod Coil Conveyor.

This 350-ton Birdsboro Up and Down Cut Shear and Gauge is used for hot shearing of 8" x 8" carbon steel blooms.



MM-54-56

BIRDSBORO

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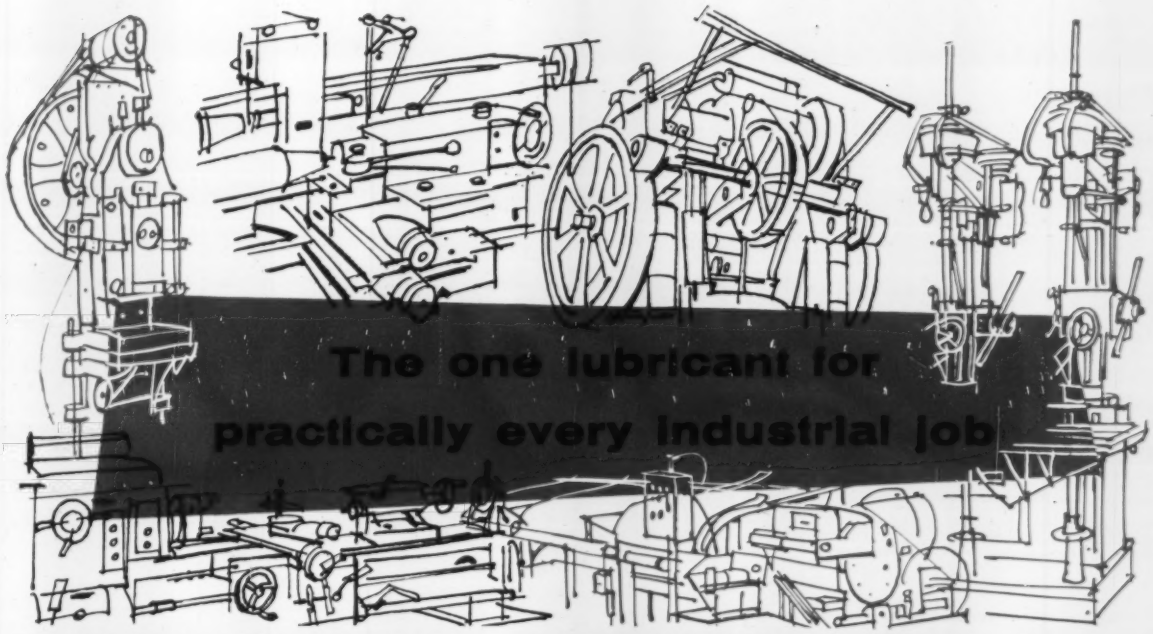
New York Office: **Engineering Supervision Co.,** *120 West 42nd Street, New York 36, N.Y.*



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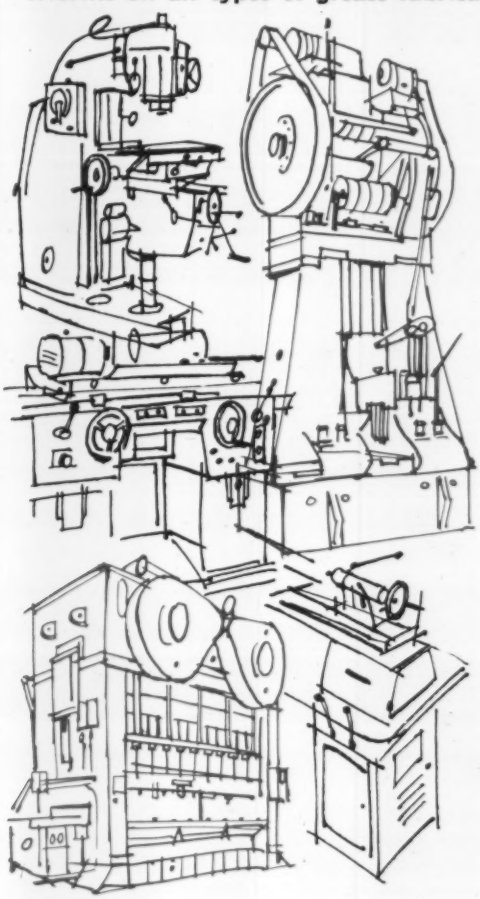

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- **Reduced losses** from lubricating error
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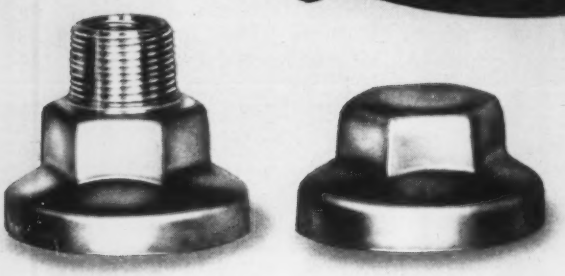


Pickling eliminated . . . To form these radiator steam vent shells requires nine drawing operations and four anneals. Prior to the use of a steam Homo furnace, pickling was necessary after each anneal, then a heavy pickle and buffing before chrome plating. Since switching to steam annealing this midwestern manufacturer has been able to eliminate all pickling . . . uses only a quick buff and bright dip before plating. Not only did the furnace pay for itself in a few months through handling and labor savings, but die life has considerably improved due to the clean surfaces of the brass.

Zero rejects . . . Beryllium-copper parts, such as switch and amplifier components for electrical equipment which must be plated after age hardening, heat treat in steam atmosphere with minimum oxidation . . . come from the furnace so much cleaner than in air that subsequent pickling operations can be substantially reduced and the difficulty of rejects eliminated.

The switch components above, for instance, formerly required pickling in hot sulphuric acid, a hydrochloric acid dip and a bright dip before plating . . . and plating rejects averaged 25%. Annealing in a steam atmosphere eliminated the two acid dips by preventing scale formation. Costs came down even more because the cleaner parts reduced the reject rate to zero.

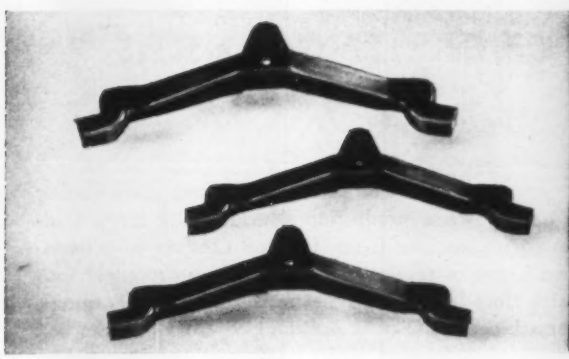
Catalog TD2-620(1) tells all about it too;
we'll be glad to send you a copy.

Cut your Pickling and Cleaning Costs . . . with Steam Treating!

If pickling and cleaning operations are part of your production costs . . . on either ferrous or non-ferrous metals . . . there's a good chance steam atmosphere heat treating will prove an unsuspected source of surprisingly substantial savings for you.

Within the past few years, many plants have successfully overcome surface cleaning problems on structural steel alloy parts . . . have substantially reduced or eliminated pickling between draws of brass fittings and parts . . . have reduced rejects due to oxidation on parts of beryllium-copper and aluminum. In short, steam atmosphere heat treating has proved an easy, safe, inexpensive shortcut to uniform, scale-free metal surfaces.

On the opposite page are just four examples to illustrate our point. If you want others . . . or details on any of these . . . or want us to help investigate possible savings in your plant, just phone your nearest L&N office or write us at 4957 Stenton Ave., Phila. 44, Pa.



Buffing cost cut 40% . . . Many aluminum parts used as electrical and machinery components fabricated from the hardenable alloys such as Alcoa 61S or 75S require a final chemical or mechanical cleaning after solution treating. On such parts solution treating in a steam atmosphere results in a more uniform, more metallic and more reflective surface finish, compared to the duller matte finish obtained in air. A typical example are these aluminum alloy clutch arms. Solution treating them in a steam atmosphere saved up to 40% of the cost of subsequent buffing operations.

Threads kept clean, uniform . . . In the manufacture of hardened bolts and studs, cold-headed bolts, etc. for automotive and aircraft use, surface cleanliness of threaded sections becomes extremely important to speed-up assembly operations. In other cases where torque-indicating wrenches are used, the presence of surface scale can easily cause a false reading resulting in improper tightening and subsequent premature failure of the bolt. When such parts are steam tempered after hardening they come out clean and free from scale, with a uniform blue-black finish. When pickling is necessary, prior to plating or other surface finishing, the uniformity of the surface finish results in substantially reduced pickling time. For example, pickling time prior to plating the cold-headed bolts above was reduced 66% and rejects were eliminated, after steam treating became standard procedure.

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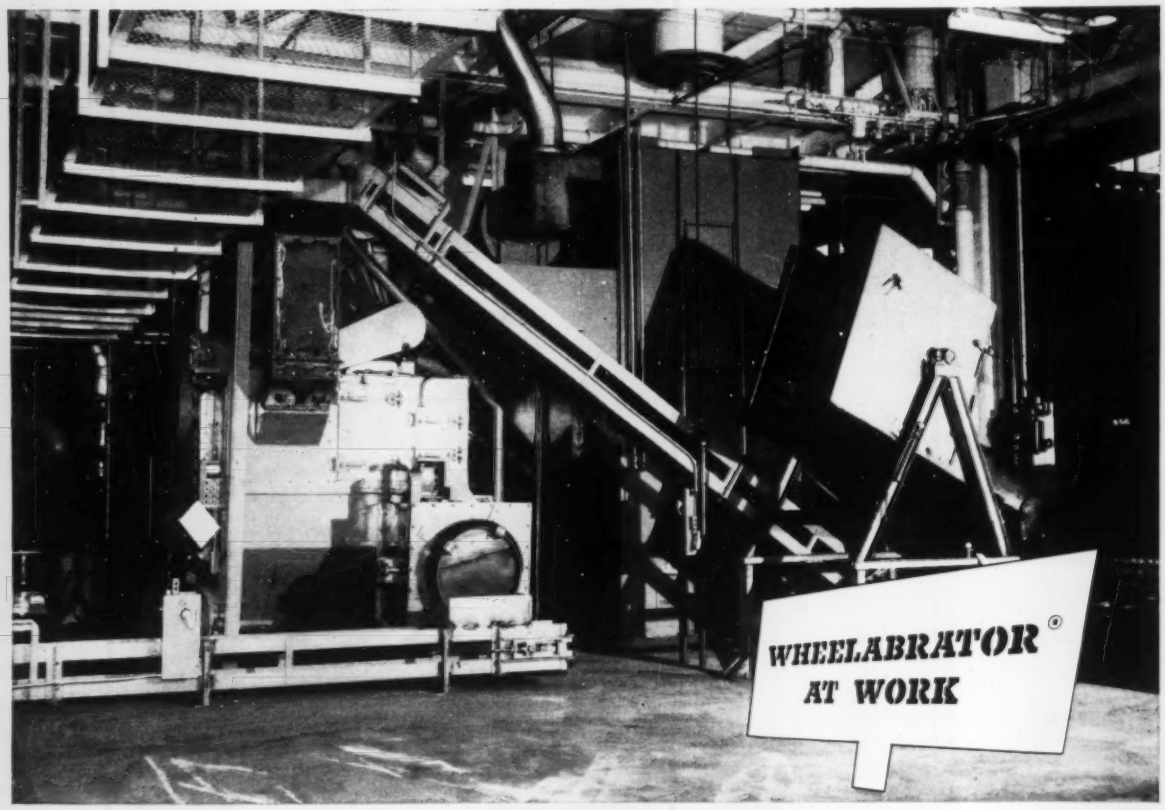
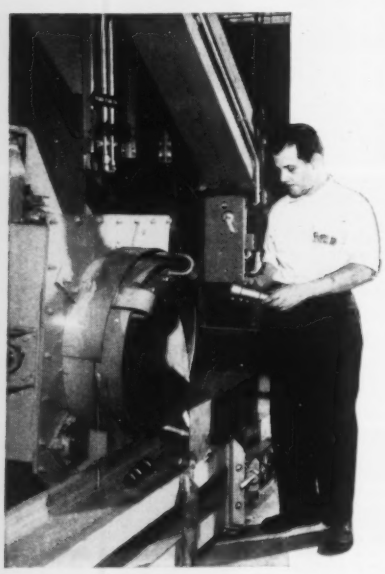


NO MAN HOURS FOR CLEANING HERE!

airless blast equipment becomes an integral part of automated line in processing automotive forgings



The picture above was taken during the normal production schedule of a large, mid-western automotive plant. The 26″ Continuous Wheelabrator Tumblast shown is one of several that have been incorporated into automated processing lines for forgings and machined parts. Forgings, brought to the machine by lift truck are dumped from the tote box (shown upended at the right of picture) into a hopper, and then fed by conveyor into the high-production airless blast Continuous Tumblast where all forging scale is uniformly removed. Emptying on to another conveyor, the cleaned forgings are carried on to heat treat operations, into another Wheelabrator machine, and then on to machining. High capacity and freedom from mechanical problems and maintenance difficulties assure required performance of Wheelabrator equipment with a very minimum of attention.

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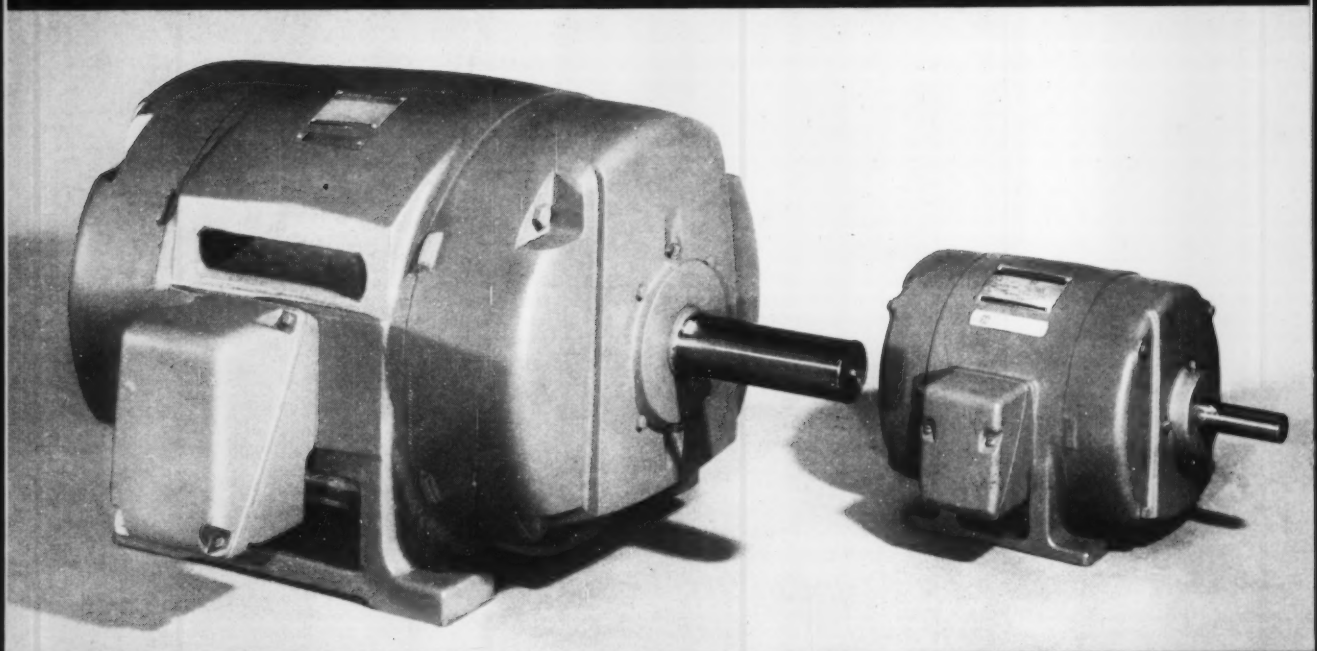
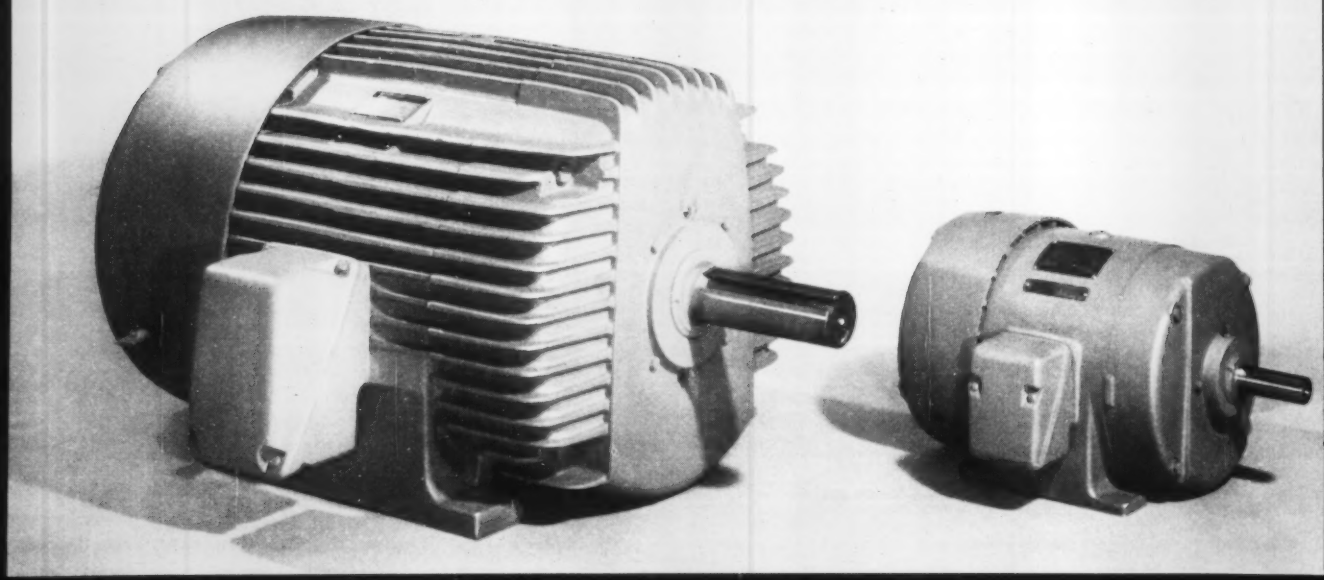


TOTALLY ENCLOSED



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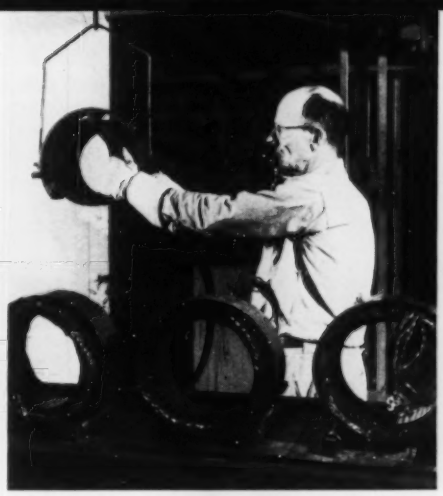

BUILT TO PROVIDE LONGER LIFE—Longer stator life is provided through use of new, advanced insulation system utilizing Mylar* slot insulation, Formex® magnet wire, non-wicking Geoprene® leads and Dri-Film® silicone coating.

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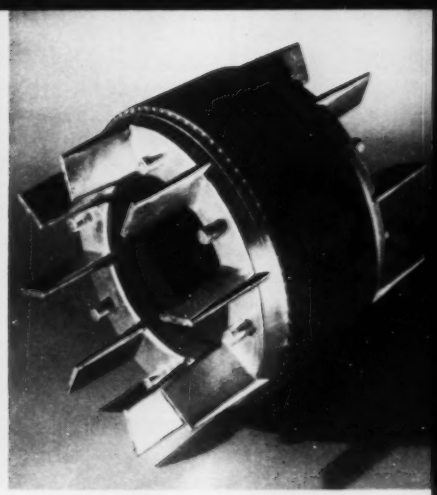

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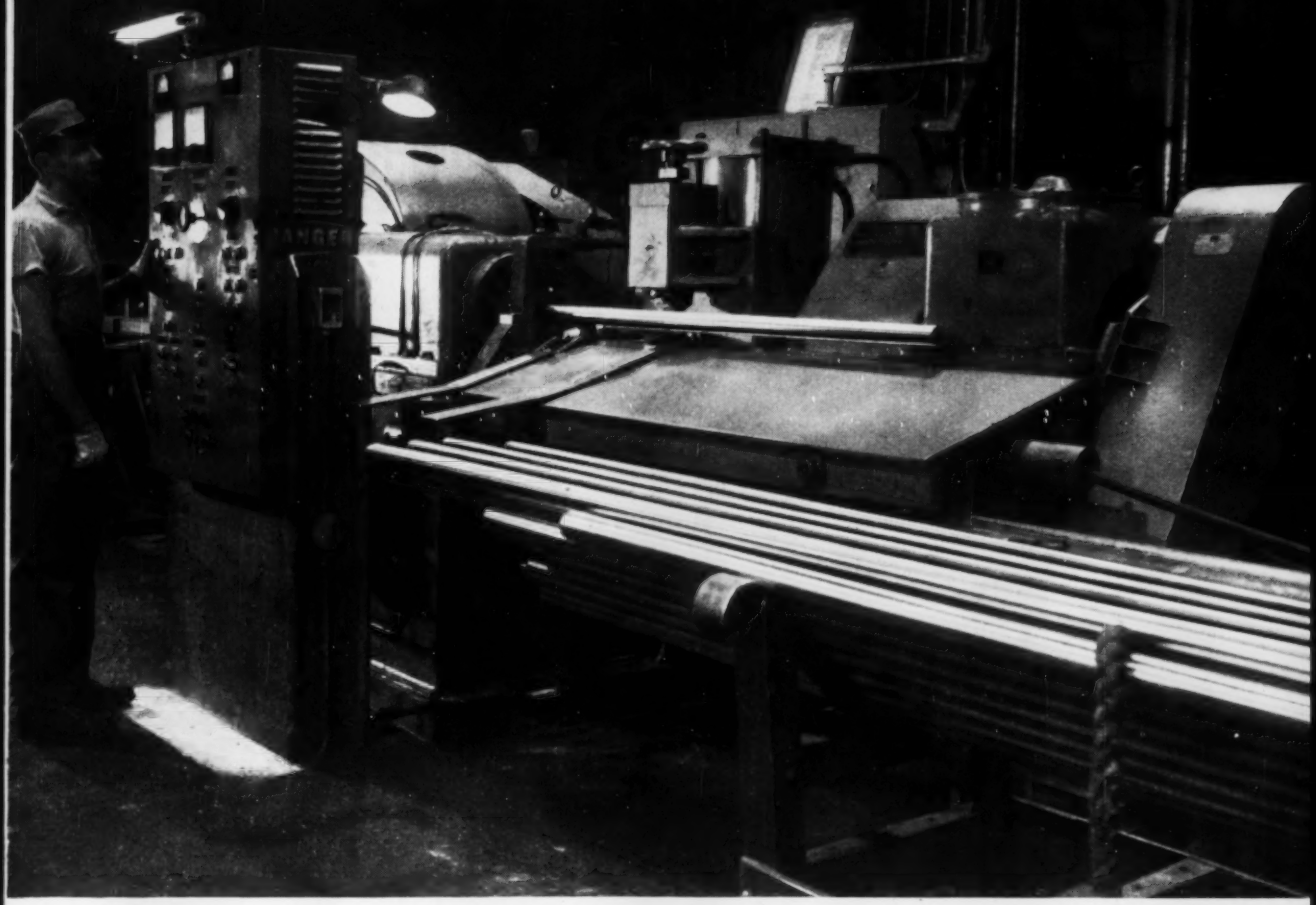

This Medart Centerless Bar Turner is a recent addition to the cold finishing department of an Eastern specialty steel mill. It is capable of turning at speeds of 12 feet per minute and removing as much as ¼-inch of metal.

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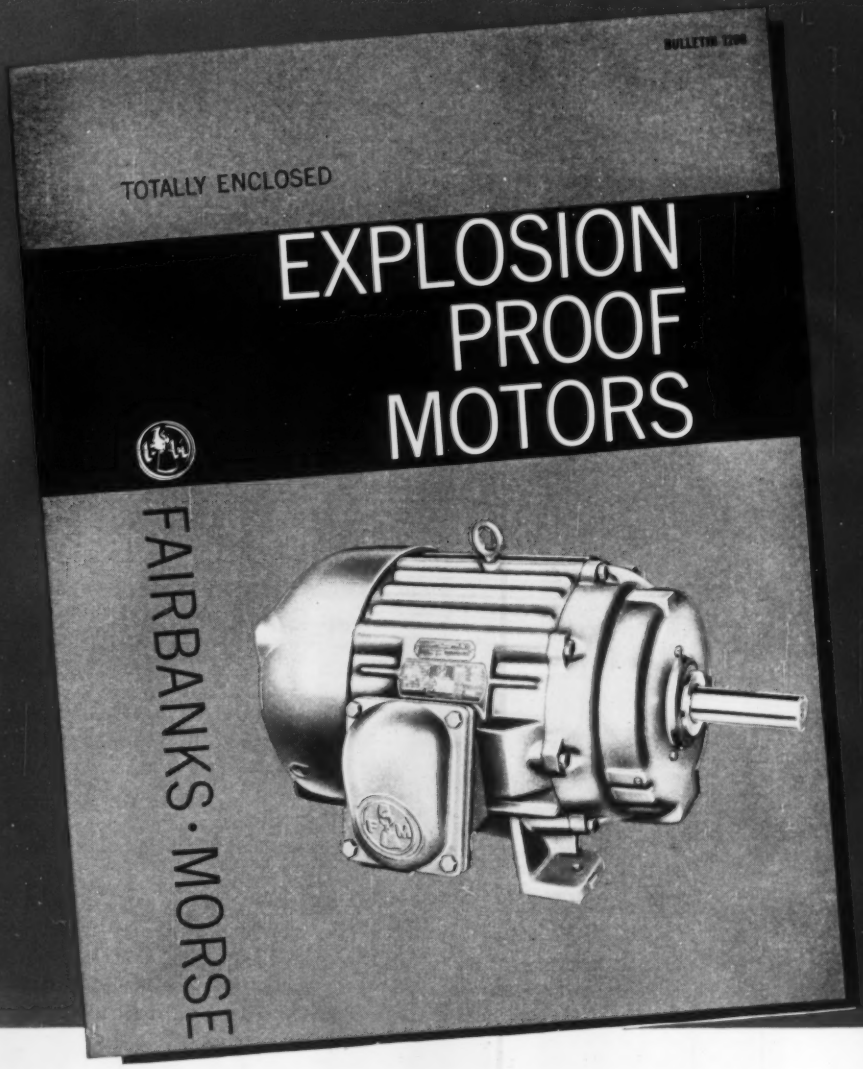

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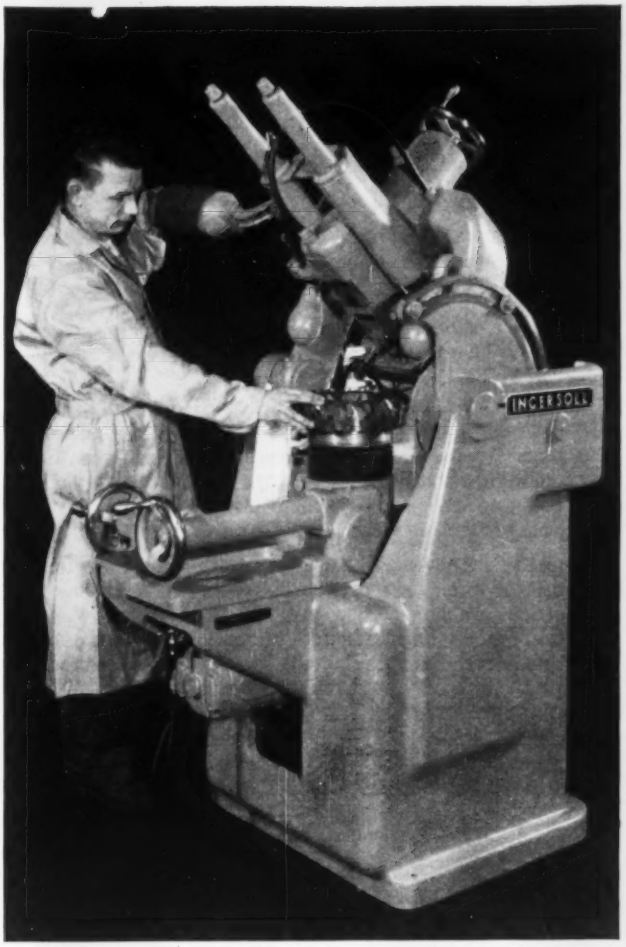

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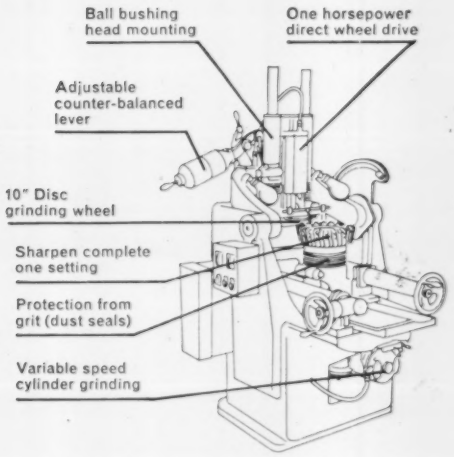
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Metalworking Outlook

U. S. Third as Auto Exporter

West Germany, Great Britain, and the U. S., in that order, are the world's leading automotive exporters. Of 1.6 million autos, trucks, and buses exported last year, the trio accounted for 1.3 million. The U. S. continues as the No. 1 exporter of trucks and buses, selling 196,216 in 1956, compared with 175,791 in 1955. Britain is second, and West Germany is third. In 1956, foreign manufacturers sold 55 per cent more of their vehicles in the U. S. than in the previous year. The top ten foreign sellers in the U. S.: Volkswagen, MG, British Ford, Jaguar, Hillman, Mercedes-Benz, Austin-Healey, Renault, Triumph, and Porsche.

Of Things To Come

"American business has never faced a brighter future," says L. S. Hamaker, general manager of sales for Republic Steel Corp. Some of his predictions: Production of 6 million cars in 1958; output of 8 million cars and 1.4 million commercial vehicles by 1965, with 11 million two car owners, twice what we have today; 80,000 wells drilled annually by 1965; capital expenditures of $60 billion by electric utilities during the next decade; new construction of $65 billion annually by 1965, compared with $44.3 billion in 1956; $8 billion to be spent on highway construction yearly by 1960, compared with a $5-billion annual rate now.

New Stimulus for Taconite

A new method for pelletizing and heat treating magnetic concentrates produced from taconite has been announced by Allis-Chalmers Mfg. Co. It claims the process offers economies in fuel and maintenance and virtually eliminates pellet breakage—limitations of current processes. Fuel economies are obtained through re-use of exhaust gases. Optimum pellet strength is achieved by subjecting pellets to kiln temperatures between 2350 and 2450° F.

Steel's SUB Starts

September marks the start of payments of Supplemental Unemployment Benefits (SUB) to laid-off steelworkers. Union officials say some $70 million has been built up in trust funds by employers' contributions since the program was negotiated a year ago. Payments won't be heavy at the start. Special arrangements have been worked out for idled employees in four states that have barriers against SUB.

Five States Control Pension Funds

Five states have taken direct action to control the handling of employee pension and welfare funds, points out Commerce Clearing House. Fund trustees in New York, Washington, and Wisconsin must register and re-

Technical Outlook—p. 103 Market Outlook—p. 161

port details of collections and distributions involved in the management of such funds. Similar requirements go into effect in California and Connecticut on Sept. 11 and Oct. 1.

Effects of a Hoffa Election Victory

James Hoffa is virtually certain to be elected president of the Teamsters at the union's convention this month. When that occurs, the union will be expelled from the AFL-CIO, but that probably won't trouble Mr. Hoffa. The miners and longshoremen have done all right as independent groups. But what may bother him—and all organized labor—will be state and federal laws to control unions that will be enacted, at least partly as a reaction to the kind of power Mr. Hoffa typifies. Look for fairly tough labor legislation to be passed in Washington and extremely strict laws enacted in some states next year (see page 70).

The Billion-Dollar Picture

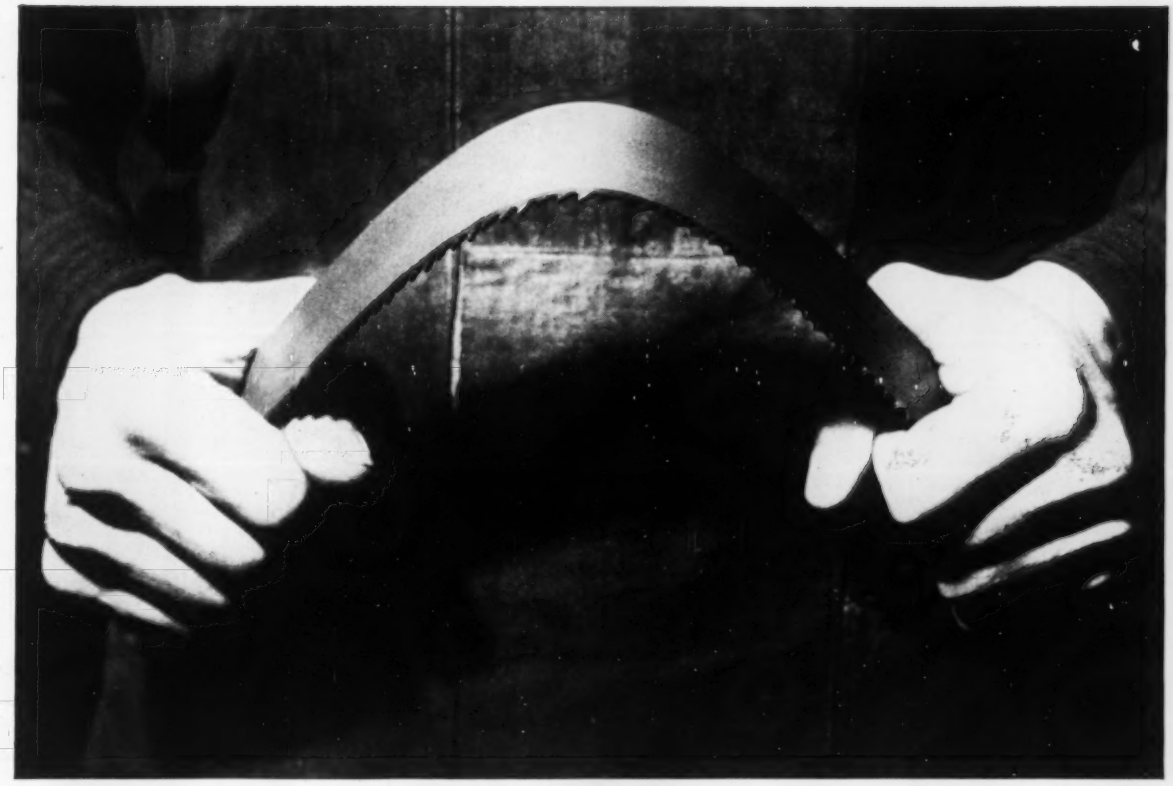
Four of the major photographic equipment firms have finished or are embarked on expansion programs costing a total of nearly $40 million. That all indicates how big the picture business is today. Sales of equipment (excluding film) hit $868 million in 1954, reached $1 billion last year and are doing even better in 1957. Some 150 firms make the equipment, employing nearly 70,000. The bulk are in New York state.

Status Report on the ICBM

The U. S. will test fire the second Atlas Intercontinental Ballistic Missile (ICBM) in October. Test firing of the first (June 11) failed. Some 40 operational Atlases will be in inventory by 1959. Some 80 of the other ICBM, Titan, will be stocked by 1961. Initial test firing of the Titan is at least a year away. Principal contractors for the Atlas: Convair Div. of General Dynamics Corp.—airframe; General Electric Co.—nose cone; North American Aviation Inc.—propulsion; GE and Burroughs Corp.—guidance. For the Titan: Martin Co.—airframe; Avco Mfg. Corp.—nose cone; Aerojet-General Corp.—propulsion; American Bosch Arma Corp., Bell Telephone Laboratories, and Sperry-Rand Corp.—guidance.

Straws in the Wind

A new Office of Defense Mobilization order refusing consideration of extended applications for fast tax writeoffs kills North American Steel Co.'s hopes for tax aid to build an integrated mill in Iowa . . . Lockheed Aircraft Corp. is extending its nuclear power projects to missiles . . . James J. Nance has been shifted from marketing vice president of Ford Motor Co. to vice president and general manager in charge of the Lincoln-Mercury Div. . . . Roller bearing prices are going up.



THIS is No Ordinary Power Hack Saw Blade

This is the *unbreakable* MARVEL High-Speed-Edge Hack Saw Blade—the first bi-metal blade—invented, developed and introduced by MARVEL. This blade is a combination of two materials best suited to the requirements of an efficient hack saw blade . . . a narrow high speed steel cutting edge permanently welded to a tough, non-brittle alloy steel body. Each blade is triple tempered to assure long life and maximum toughness to the cutting edge. Development of this high-speed-edge blade made it possible to cut any kind of material from the free machining steels to the toughest of alloys, fast, accurately and economically. Just one type blade to handle any job — no switching blades to cut different materials. Like all good things, attempted copies of this blade have been numerous, but its performance has been *unequalled* by any of the imitators.

The MARVEL high-speed-edge hack saw blade can be tensioned from 200% to 300% tauter than any ordinary hack saw blade, a definite advantage which permits heavier feed pressures to be used without deflection or fear of breakage.

An extremely rugged cutting tool, this one type blade, the MARVEL High-Speed-Edge Hack Saw Blade, will cut any machineable metal with outstanding economy, accuracy, long life and complete safety—*it is unbreakable.*

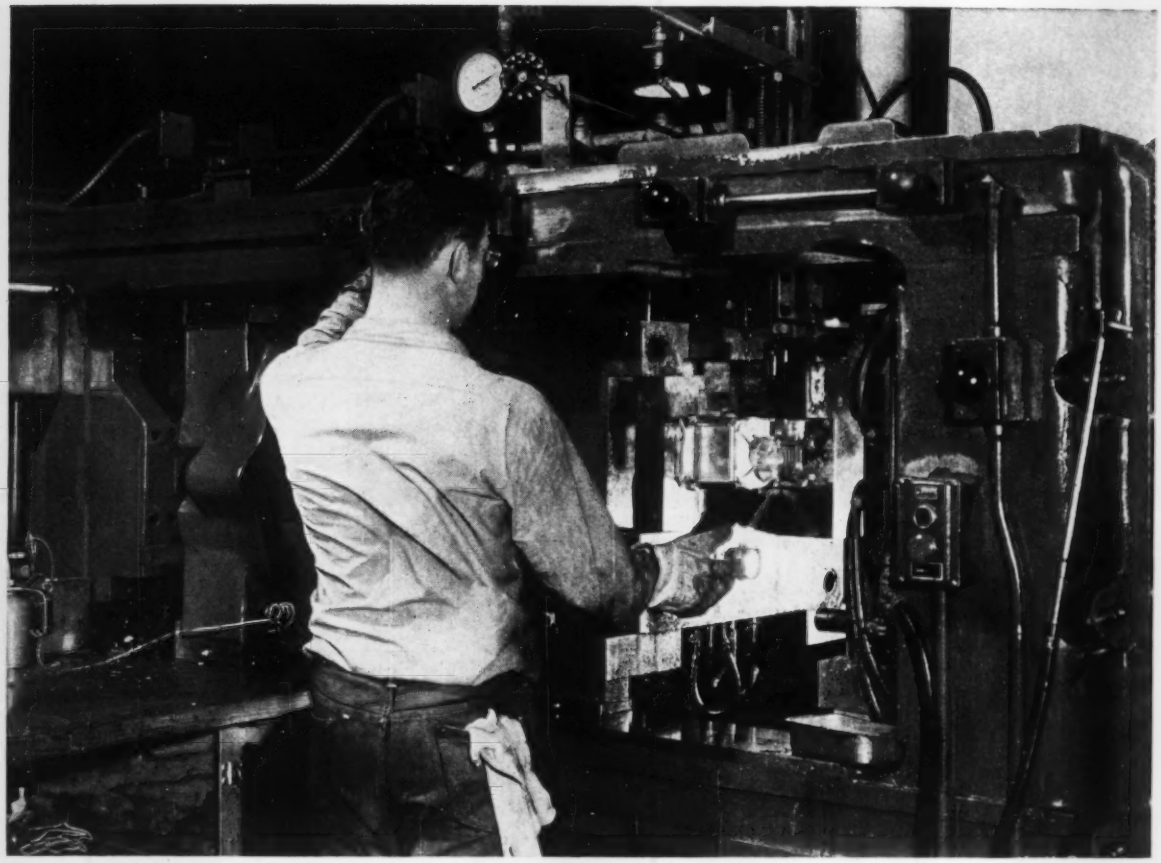
Ask for MARVEL Blades by name and you can be sure you're getting the best on the market. Leading Industrial Distributors have them in stock.

B-1120

Write for latest cutting tool Bulletin and the name of your nearest MARVEL Distributor

MARVEL Metal Cutting SAWS

ARMSTRONG-BLUM MFG. CO. 5700 W. Bloomingdale Ave., CHICAGO 39, U.S.A.



Cast Nickel Steel Frame heat treated to a minimum tensile strength of 100,000 pounds per square inch, yield strength of 80,000, provides properties needed to handle stretching action caused by 800-ton clamping force. This 40,000-pound die casting machine was built by Lester Engineering Company, Cleveland, Ohio.

Stretches with no permanent set...

High strength of nickel steel casting boosts life of repetitively stressed machine frame

The cast nickel steel frame on the die casting machine above accepts and recovers from a clamping force of 800 tons 100 times-an-hour... round the clock!

This punishing stress cycle caused Lester Engineering Company, builder of the machine, to discard four differently designed frames fabricated from mild steel. The firm then switched to a nickel steel frame casting which has proven completely dependable.

On the basis of this performance, Lester Engineering has standardized on cast nickel steel frames for its entire line of plastic molding and metallic die casting machines.

For high strength, toughness and impact resistance

Nickel steel castings offer a combination of properties that might be the key you have been looking for to improve performance and service life of your own machines and machine tools.

For a look-see on how you can take advantage of the properties of nickel steel castings, send for your copy of "Nickel Alloy Steel Castings in Industry."

And remember

INCO NICKEL ... brings you

INCO+SERVICES

Whenever you are looking for answers to your metal problems, all the information and help we can give you are yours for the asking. For instance ...

- **+ Corrosion Service**
- **+ High Temperature Service**
- **+ Casting Information**
- **+ Field Information Centers**
- **+ Technical Publications**

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N.Y.

Think for Tomorrow

In the minds of most of us, Labor Day marks the transition from the summer doldrums to what we perennially hope will be a period of brisk autumn activity.

What we think, say, and do at this time can have a great psychological influence on the shape of things to come.

So we need to view the business picture objectively before sounding off on whether we think business is going to move up, down, or sideways. Here are some of the factors to consider:

The steel industry had its third best August in history with production of 9.2 million tons and operations averaging 80.5 per cent of rated capacity. In the first eight months, it produced 78.6 million tons. That is 6.2 million tons more than the industry turned out in the 1956 period (when most plants were strike bound for a month) and 2.7 million tons more than its total for the first eight months of 1955.

If production averages 9.6 million tons a month (86 per cent of capacity) in the last four months, the 1955 record of 117 million tons will be matched. Operations are rising even before feeling the full impact of 1958 automobile requirements.

Passenger car production through August at 4.4 million was 350,000 units ahead of the 1956 pace, and it is believed that 1.8 million more will be assembled by Dec. 31. At 6.2 million units, 1957 will turn out to be the third best year for autos. Hot sales competition among the Big Three and the possibility of a strike next June may be strong sales stimulants.

Appliance makers believe the worst of their current problems are over. The slump in housing seems to have bottomed out, with new starts this year at the annual rate of 960,000 units. The improved mortgage situation may lift new starts to 1.1 million in 1958.

Capital expenditures for new plant and equipment will total $37.4 billion this year vs. $35.1 billion in 1956. Machine tool orders again are on the rise. In 1958, one new auto engine program alone could involve $700 million in tooling. Even though defense spending has been trimmed, the average fiscal expenditure of $38 billion will be mighty hefty.

Some of the inflationary pressure has been relieved by higher interest rates, but the cost of borrowing money still is by no means prohibitive. As long as workers can demand and get higher wages at a rate faster than their increase in productivity, some measure of inflation is going to be with us.

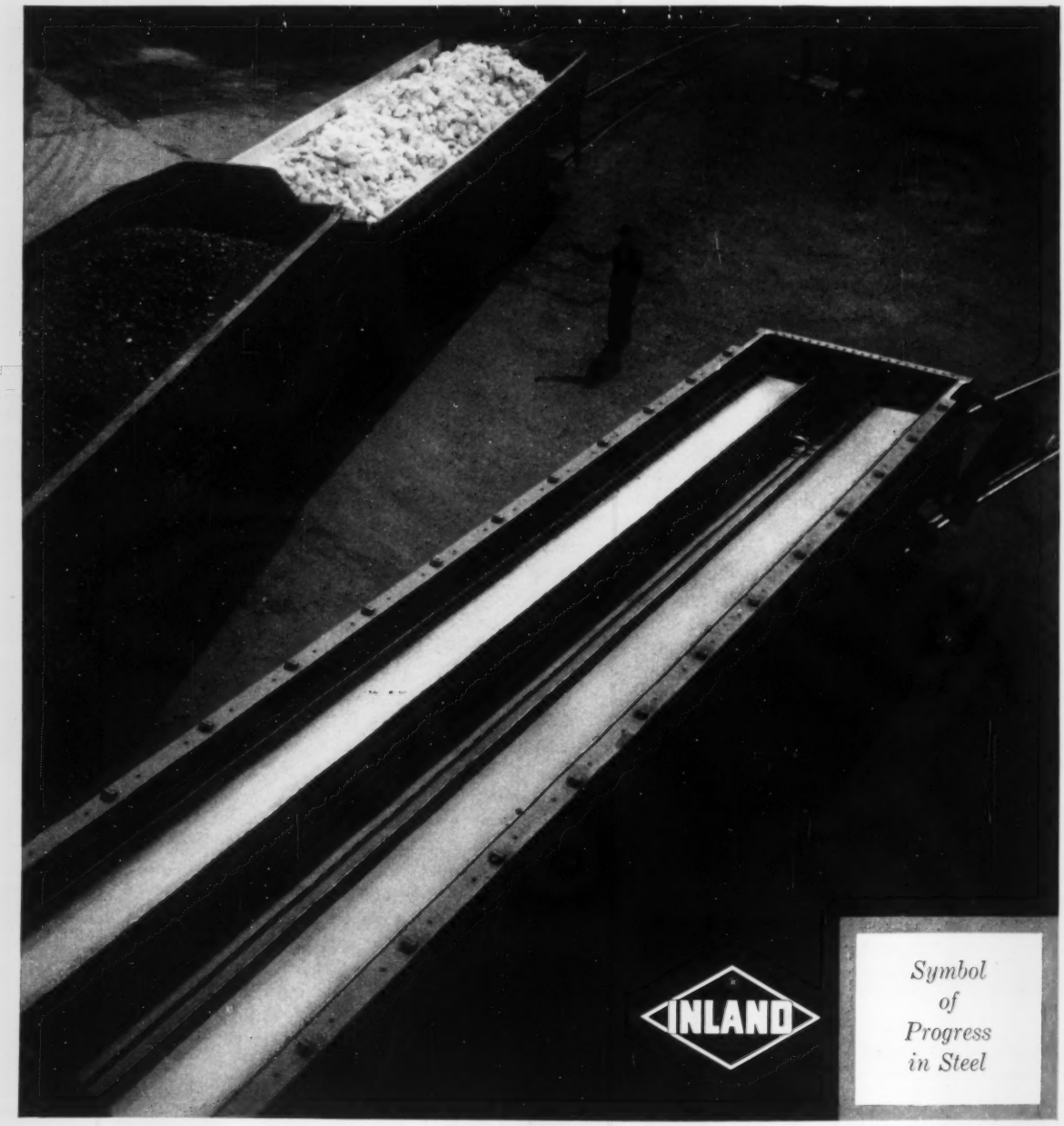
Although the indicators hold much promise, we tend to be distracted by such immediate problems as high production costs, price competition, and defense orders that have been canceled.

But the wisdom of keeping the complete business picture in proper perspective in our day-to-day activities is self-evident. The thinking, talking, and acting we do today can lay the psychological groundwork for a thriving tomorrow.

Irwin H. Such
EDITOR-IN-CHIEF

Change trains at Indiana Harbor

Iron ore, coal and limestone from Inland's own mines and quarries funnel into one of the world's largest steel plants . . . at Indiana Harbor. Here they "change trains." But, before they do, they themselves are changed into many useful steel mill products. Every step of this transformation takes place in Inland furnaces and mills, with Inland people supervising, testing, inspecting and performing every operation. This complete control of steelmaking, from raw material to finished product, means fine, uniform steels shipment after shipment.



INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis • Kansas City • Indianapolis • Detroit • New York

Appliance Goal for '58: Recover to '56 Level

(Factory units sales)

	1958	1957	1956
Automatic dryers (gas & electric)	1,600,000	1,400,000	1,601,710
Automatic washers	3,400,000	2,950,000	3,330,200
Washers-dryers	250,000	200,000	102,406
Dishwashers	450,000	350,000	400,000
Electric ranges (including built-ins)	1,585,000	1,385,000	1,585,000
Electric refrigerators	3,800,000	3,550,000	3,700,000
Electric water heaters	870,000	775,000	870,000
Farm & home freezers	1,000,000	850,000	975,000
Gas ranges (including built-ins)	2,020,000	1,977,700	2,177,400
Gas water heaters	2,629,000	2,500,000	2,762,100
Household radios	9,250,000	9,100,000	8,924,391
Room air conditioners	1,650,000	1,750,000	1,800,000
Television receivers	7,000,000	6,800,000	7,387,029

Sources: Manufacturers' associations supplied 1956 figures; STEEL estimates for 1957; 1958 based on interviews with manufacturers and associations.

Suppliers' Outlook Mixed

Greater production of household equipment next year will mean more business for partmakers. But trend among appliance producers is to make rather than to buy

APPLIANCE MAKERS are hitting the comeback trail in the second half, and they are confident that the industry as a whole will climb back to the top in 1958 (see table above).

The 10 per cent boost anticipated for next year should cheer hundreds of component suppliers. They have been hard hit by this year's 10 to 15 per cent drop in appliance production. But that cheer is tempered by an unmistakable long term trend: Major producers are switching from buying to making their own parts.

Matter of Economics—"While I see nothing in the immediate future (1958) to indicate a diminishing role for partmakers, we are continually re-examining all phases of our manufacture to see where we can cut costs," says a purchasing agent at Westinghouse Electric Corp., Columbus, Ohio.

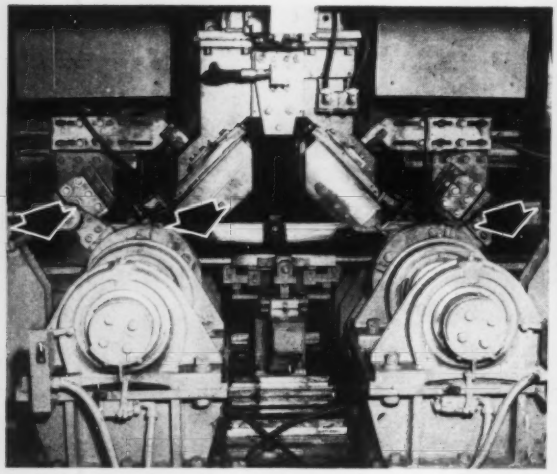
Producers tend to make large parts. Suppliers making the smaller ones, such as switches, timers, precision castings, trim, and fasteners, stand a better chance of coming out on top as long as they can meet competition on quality, delivery, and cost. Considering that some of the largest appliance makers buy as much as 65 to 75 per cent of their components, there will still be plenty of business for outside suppliers for some time to come.

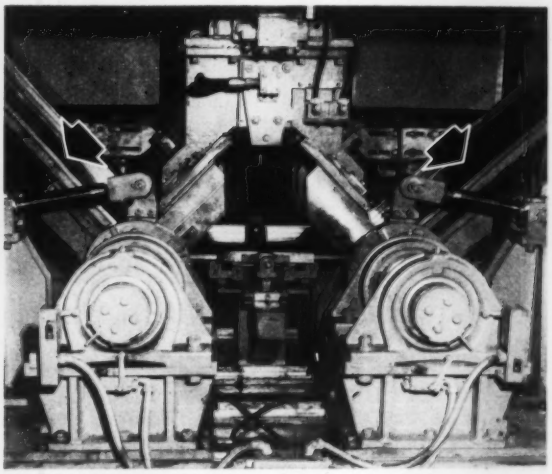
Basis for Optimism—Appliance producers themselves can see no reason why 1958 should not live up to expectations. They are at a loss to explain the shortcomings of 1957. "We're convinced the basic demand is still there. The population is growing; personal earnings are at an all-time high; savings are better than they have been for years; and we know we have a quality product at a fair price," declares the vice president of one full-line company.

He discounts the effects of lower housing starts as a major deterrent to sales. "Take refrigerators, for example," he says. "In round figures that is a 4 million unit business a year for the next five years. Last year, housing starts were a little over 1.1 million, and probably fewer than 70 per cent of those had new refrigerators. This year, housing will be off about 10 per cent. It would be pretty hard to lay our problems at the doorstep of such a small decline in our overall market."

Industry officials feel that perhaps they "borrowed" some of this year's business in late 1956. Many new model introductions were made in the fourth quarter instead of the spring of 1957. Optimism was high then, and consumers were in a spending mood. The "cautious optimism" of 1957 has delayed many purchases of major appliances, and producers hope that the tide will turn in 1958.

Inventory Situation—Most appliance sales managers feel conditions are more favorable today for a resurgence than they have been





At Westinghouse Electric's Columbus, Ohio, plant, the switch to the square look enables the company to cut costs by automating the fabrication of refrigerator cabinets. Coiled steel is fed into a flying shear which cuts it in lengths of 142 to 178 in. It goes through a roller leveler, a piercer, and notcher. Front and rear flanges are rolled on; corners are shaped and overlapped; and hinge reinforcement bars are welded on before the sheet reaches the combination tangent bender and corner welder (left). Hydraulically operated shoes bend the sides

for some months past.

Fred Maytag II, president of Maytag Co., Newton, Iowa, thinks the inventory adjustment has about run its course. The Electronics Industry Association says television set inventories are down more than 300,000 units from a year ago. John B. Huarisa, president of Admiral Corp., Chicago, says inventories are at the lowest level in five years. Most producers agree that this means the current pickup in business can be traced directly to greater sales.

Uptrend Started—Herman Lehman, vice president of Frigidaire Div. of General Motors Corp., Dayton, Ohio, feels that industry sales and production in the second half will be at least as good as they were in the first half. This means that activity in the last four months will be at a good rate to make up for vacation shutdowns and sluggish demand during July and August.

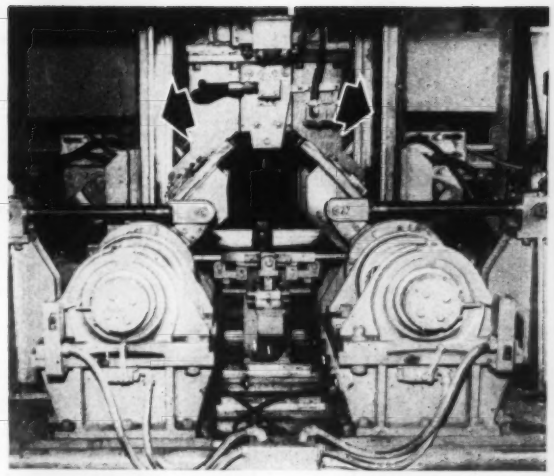
From practically every quarter come reports that the upward break is definitely here. Only a small part of it can be attributed to seasonal factors. Mostly it's the result of new model introductions which began this summer and will run through November. In this respect, the appliance industry is taking a page out of the auto industry's book. Another similarity is the variety of models in the same appliance. You can now buy everything from the stripped-down economy model to the loaded de luxe version.

Sales Pitch — The billboards on the road back will be filled with almost every pitch the industry has ever used, plus some new ones. Sales managers are banking on the "new square look" to boost replacement sales by making all pre-1956 appliances look out of place. New features on old reliable lines will be pushed. Examples: More flexible wash cycles and water temperatures on automatic washers; delayed timers for laundry equipment; new drying cycles for "wash and wear" modern fabrics; ice cube ejectors and greater storage space; greater flexibility of heat controls in kitchen ranges; water heaters that adjust to demand; wide angle TV picture tubes.

Color will be pushed even more this year. For instance, Westinghouse will offer 55 color combinations on its refrigerators. Color hasn't been everything the industry hoped it would be a year or so ago. Most manufacturers admit that only about 5 per cent of their production carries color, but they feel that brightly hued display models attract customers who eventually buy the standard white. The big problem with color is the unusually large inventory a dealer or distributor must carry to assure prompt delivery. "When a woman wants an appliance, she doesn't want to wait four weeks for the dealer to order a special color or model," says a sales manager.

Sales Tactics — Relatively new appliances will help put 1958 in the plus column. The automatic dishwasher, an oldtimer with a few new twists, is one of the hottest items. The washer-dryer has been slow to catch on, but this could be the year for big gains. Several producers are offering their first versions for 1958, and others admit that if these click, they have plans to join the bandwagon. The refrigerator-freezer has answered the frozen food storage problems of apartment and small home dwellers. It may borrow some sales from full-size freezers, but producers claim that eventually it will result in more sales of the larger units as families outgrow the combinations.

Producers are strengthening dis-



around square cornered dies (center), forming sides and top of the cabinet. Front top corners are seam roller welded (right) before the box moves on. The bottom is welded on and all interior fixtures and trim are added on the line, which makes 180 boxes an hour

tributor and retail channels. Easy Laundry Appliances Div., Murray Corp. of America, Chicago, is expanding its field sales organization and increasing its regional units from 8 to 13. Westinghouse last month called in all its distributors for a week of conferences in Columbus, Ohio, to strengthen its sales efforts. A prime point emphasized in almost all such efforts: Sell quality, not price.

Appliance dealers also are putting more emphasis on the used equipment market to stimulate sales of new units. "The used appliance market will never mean to our industry what the used car business means to the auto industry," states one sales vice president. "But it is one method of helping to push obsolescence of appliances and increasing new sales."

Long Range Outlook — Predictions for next year are full of "ifs," but for the long term, the appliance industry sees nothing but increases. Family formations, now at a relatively low level, will begin to make their big gains in 1959-60. The replacement cycle, figured roughly at 12 or 13 years for major appliances, will begin to pay off next year. (The bulk of appliances in use today date from 1946.)

In the 1956-66 period, Hotpoint Co., Chicago, believes industry unit sales of major electrical appliances will look like this:

Automatic washers — 36 million.

Automatic dryers—19 million.

Washer-dryers—6.3 million.

Free standing ranges—16 million.

Custom ranges—6 million.

Dishwashers—11 million.

Water heaters—13 million.

Refrigerators—51 million.

Air conditioners—28 million.

Food freezers—11.8 million.

TV receivers—100 million.

Major Problems—Several hurdles stand in the way. Three of the main ones — declining profits, stable pricing policies, and overproduction—are shared by many other industries. But the fourth—obsolescence—is peculiar to this segment of the consumer goods industry. An automobile is obsoleted within about three years, roughly a quarter of the replacement cycle in major appliances. "One of our biggest problems is that we make these appliances too good," says John Craig, vice president of Westinghouse.

"Frigidaire is firmly committed to a policy of planned obsolescence," says Mr. Lehman. "That is the big reason behind our 'sheer' look. Introduction of new features periodically is a part of that program."

The square-cornered appliances also are part of the industry's program to cut costs by automating production. Westinghouse's completely automatic refrigerator cabinet line (see photographs at left) represents considerable savings over the methods required to produce appliances with curved surfaces.

Costs, Prices Up — Costs continue to spiral upward. Materials and labor are 5 to 10 per cent higher than they were a year ago, and "the outlook for cost reduction, except on a minor scale, is only fair at best," say officials of Philco Corp., Philadelphia. At least some of this extra cost has to be passed on to the consumer.

"This spiral is approaching the point where many consumers may go on a 'buyers strike'," says one laundry appliance manufacturer. "There must be some stabilization if the appliance industry is to continue to sell merchandise on a basis comparable to the past several years." Some producers are managing to hold the line, and the prices on some of the newer appliances may come down gradually as volume is achieved. But the industry in general looks for another increase of about 7 per cent next year.

Competitive Struggle — Dun & Bradstreet Inc., New York, says in 1940 there were 35 manufacturers of home laundry equipment. Last year, the number had fallen to 17. Among radio and TV manufacturers, the rate of failures is 100 per 10,000 firms listed by D&B. The trend is continuing into 1957. Servel Inc., Evansville, Ind., maker of air conditioners and gas refrigerators, is one of the latest to drop out. But for those who can stick it out, the future looks bright.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Kimble Glass Co.'s burette is one of apparatus industry's 22,000 items

Scientific Apparatus Sales Gain*

(Millions of dollars)

1957	$340**
1956	281
1955	232
1954	203
1953	212

* Sales of Scientific Apparatus Makers Association members.
** STEEL's estimate.

Instrument Sales Soar

Scientists' toolmakers head for another record year. They are favored by the accent on research, development, and automation. Skilled help shortage persists

SALES of scientific apparatus are headed for another record year. They stand a good chance of equaling the 21.5 per cent gain made in 1956 (vs. 1955).

Sales of laboratory apparatus, optical, and industrial instruments will hit about $340 million this year. Members of the Scientific Apparatus Makers Association sold $281 million worth of equipment in those categories in 1956.

A second product group, for which sales statistics are not available, includes recorder-controllers; laboratory furniture; nautical and aeronautical instruments; and products made by nonmembers of SAMA. Combined, the two product groups accounted for over $400 million in 1956.

R and D—The 1957 showing is based on the sweeping surge toward more research, development, and automatic processing, explains Kenneth Andersen, executive vice president, SAMA.

That trend and the instrument industry's pacemaking investment in research and development are largely responsible for the apparatus maker's healthy sales prospects, says Mr. Andersen. He estimates American industry will spend some $56.5 billion on research and development in the next ten years. In the last five years, industry has invested $19.3 billion in such programs.

Many Products — Scientific apparatus makers (about 1600 companies, many of them small) catalog some 22,000 different items, plus more than 15,000 chemical compounds.

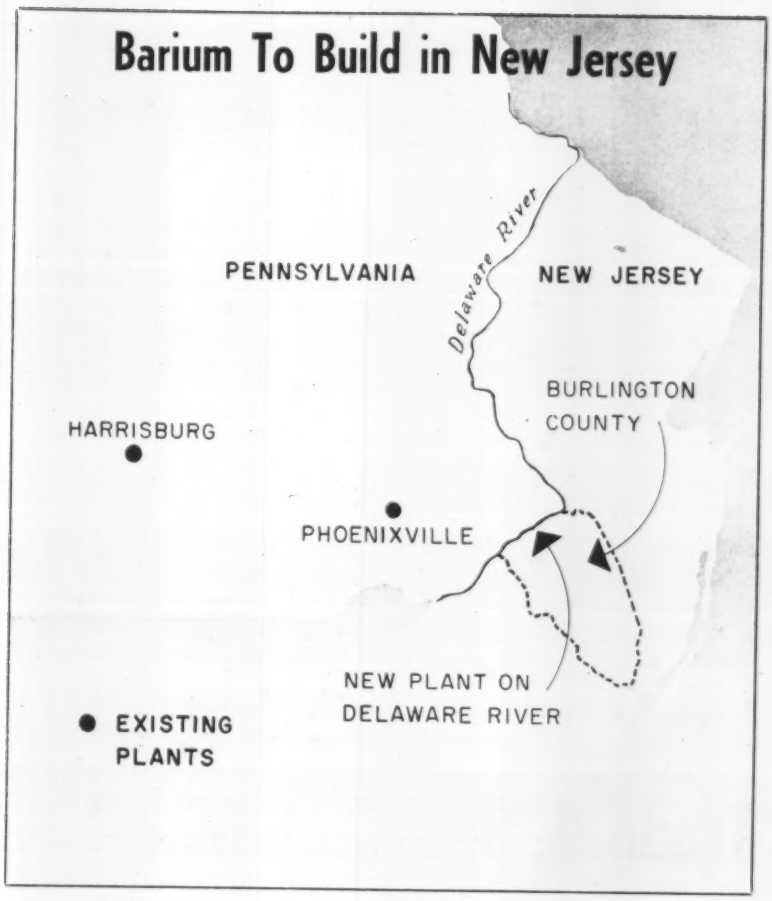
Competition, domestic and foreign, is strenuous. Japan, Germany, and Switzerland are the leading exporters.

New Horizons—Typical of new frontiers opening up are the industrial application of automatic data handling, harnessing of atomic energy and related atomic pursuits in the laboratory, and the extension of scientific apparatus into the missile and rocket fields—already estimated as a $1.2 billion industry.

Help Wanted—The shortage of technically trained people works a hardship on instrument makers. Concerned with the scarcity, SAMA has been active in high school counseling programs aimed at stimulating the interest of youth in science.

Breakdown—Equipment sales of SAMA members in 1956 included: Laboratory apparatus, $173 million; optical instruments, $14 million; and industrial instruments, $94 million.

Show—The Instrument Society of America is sponsoring its 12th annual Instrument - Automation Conference & Exhibit in Cleveland this week (Sept. 9-13). It has 500 exhibitors.



Integrated Mill for Barium

Plant will be located on 900 acres along Delaware River in New Jersey. Initial construction of $50 million facilities planned by the end of the year

BARIUM Steel Corp., New York, is asking for bids on a 1700-ton blast furnace, with oxygen conversion and auxiliary equipment, to be built in Burlington County, N. J. The company hopes that construction will begin on the estimated $50-million project before the end of the year.

Ultimate plans call for an integrated steel plant at the 900-acre site on the Delaware River. Plates, shapes (including wide flange beams), seamless pipe and tubing will be produced. Plates are now produced at the firm's Harrisburg, Pa., plant, and the other items at Phoenixville, Pa. A. J. Boynton, Chicago, is engineer in charge.

The new facility will not affect operations at the other plants, which will receive all ingots produced until finishing equipment is installed in New Jersey.

Barium has issued $10 million of convertible debentures and will complete financing arrangements when firm cost estimates are established. About 5000 tons of structural steel will go into the blast furnace and steel plant which will make 800,000 ingot tons a year.

3 Form Metals Firm

P. R. Mallory, Sharon Steel, and National Distillers will be joint owners

MALLORY-SHARON Metals Corp., a new firm with assets exceeding $55 million, will be a fully integrated producer of special metals.

Here's how the transaction shapes up:

Mallory-Sharon Titanium Corp. (now jointly owned by P. R. Mallory & Co. Inc. and Sharon Steel Corp.) will acquire the titanium and zirconium production facilities of National Distillers & Chemical Corp., plus the ownership of Reactive Metals Inc., now jointly owned by National and Mallory-Sharon.

One-third of M-S Metals will be owned by each of the three—National, Mallory, and Sharon. The new firm will have facilities for every step, from chemical processing to the fabrication of finished products.

Demand To Grow — James A. Roemer, president, M-S, stated that the commercial market will open up: "We believe the future of titanium lies in that direction." He added:

"In addition to nuclear reactors, zirconium will find a good commercial outlet in corrosion-resistant equipment for the chemical and petroleum industries."

The new arrangement is expected to be completed before the end of the year.

Inland Ups Beam Capacity

To meet "a severe shortage" in production capacity of wide flange beams, Inland Steel Co., Chicago, will double its output of this vital construction industry item.

Joseph L. Block, president, announces a multimillion dollar expansion program to lift Inland's capacity for this type beam to 54,000 tons a month. When the new facility is completed, scheduled for the first half of 1959, Inland will discontinue making steel rails.

What's in a Name?

Courts may have new "Cold Metal" case as state office grants similar name to two firms

ALTHOUGH the original firms, Cold Metal Products Co., and Cold Metal Process Co., both of Youngstown, have been dissolved, two new Youngstown firms are entitled, at least temporarily, to use almost identical names.

It's the result of a slip-up by Ohio's secretary of state's office.

A certificate of incorporation was issued to Cold Metal Products Co., a group headed by patent attorney W. B. Harpman. He said he got the name for a holding company and a fabricating company he intends to organize.

Duplication—The office also issued a certificate to Cold Metal Products Inc., headed by Franklin B. Powers, who had been counsel for the two original "Cold Metal" companies. He said he wanted to protect the name against exploitation.

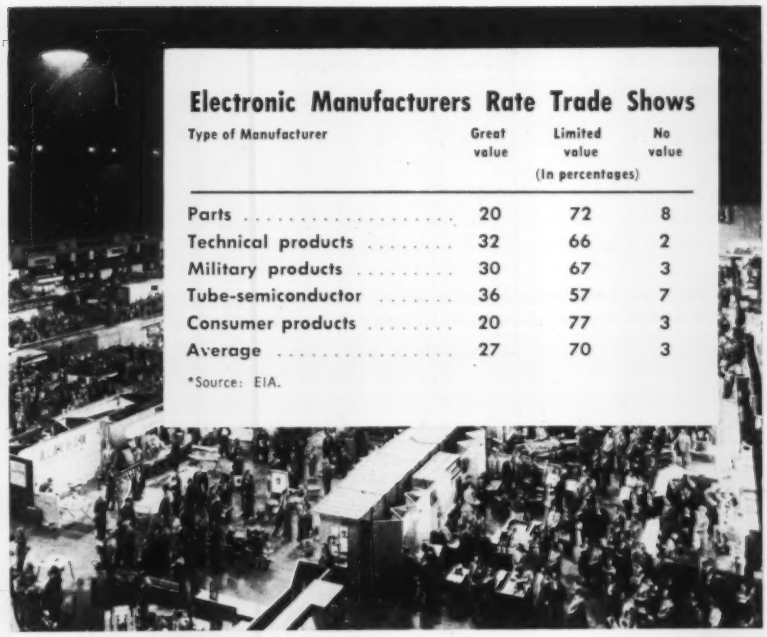
The office of the secretary of state explained that Mr. Powers had filed a reservation and posted the necessary deposit for the name but that it had been overlooked.

Litigation—So new lawsuits appear imminent over a name that has been involved in litigation for about 35 years. The Cold Metal Process Co. was organized to exploit patents on cold rolling processes. The firm had numerous suits against major steel companies for patent infringements. It was dissolved when the patents ran out.

The original Cold Metal Products Co. was a steel rolling firm. It was recently sold to Jones & Laughlin Steel Corp. and became J&L's Steel Strip Div.

Will Build 13 Cargo Ships

States Steamship Co. will spend more than $150 million for 13 cargo ships to be built in American yards between 1960 and 1972, the Federal Maritime Board reports. Construction costs in excess of those that would be incurred in a representative foreign shipyard will be borne by the government.



Electronic Manufacturers Rate Trade Shows

Type of Manufacturer	Great value	Limited value	No value
		(In percentages)	
Parts	20	72	8
Technical products	32	66	2
Military products	30	67	3
Tube-semiconductor	36	57	7
Consumer products	20	77	3
Average	27	70	3

*Source: EIA.

Trade Shows Cost More

And there are more of them, reports Electronic Industries Association. Producers of consumer products participate in the most shows, while partmakers exhibit the least

DESPITE receiving 50 per cent more requests, the average electronic manufacturer participated in the same number (six) of trade shows in 1956 as in 1955, reports the Electronic Industries Association.

The cost per show for the average producer increased 14 per cent (from $1712 to $1916). Makers of consumer products reported the highest cost—$1950.

Want Two Shows — Most electronic makers favor two shows a year. Only 13 per cent favor more than four a year. The average company received 20 solicitations to exhibit its products during 1956.

Consumer productmakers received an average of 33 solicitations, while partmakers averaged 17. Technical product producers reported the greatest increase (from 16 in 1955 to 29 in 1956).

Comments—"National shows are becoming too large," stated 44 per cent of the 132 EIA members reporting. The cost of shows exceeded the benefit received, said 24 per cent. Only 18 per cent reported trying to attend all shows where there was an opportunity of explaining products to a "reasonable" number of customers.

U. S. Merchant Fleet Ebbs

The ocean-going U. S. merchant fleet had 25 fewer active ships on Aug. 1 than on July 1 in the 1000-gross-ton-and-over category. Present number is 1129, says the Maritime Administration.

The total merchant fleet, active and inactive, numbered 3076 on Aug. 1, a decrease of four vessels during the month. There are 120 ocean-going ships currently being built or converted.

France Exempts Steel

Price freeze hits most raw material imports in effort to halt domestic inflation in wake of partial devaluation of franc. Battle is psychological. Support of press sought

FRENCH processors of steel, iron ore, and certain other basic imported raw materials are exempt from the decree of Finance Minister Felix Gaillard which froze prices as of Aug. 15. They qualify if the partial devaluation of the franc ups their costs more than 2 per cent.

On Aug. 10, the finance minister devalued the franc 20 per cent in foreign trade transactions to stimulate French exports.

In an effort to increase France's foreign currency reserve and to save the franc from bankruptcy, M. Gaillard in effect places a 20 per cent tax on most imports and offers exporters a 20 per cent bonus.

Spread Out—The price-freezing decree requires manufacturers to absorb any cost increase up to 2 per cent. In this way, the government hopes to amortize increases over various stages of production and hold retail prices near their present level.

M. Gaillard is attempting to restrict devaluation to foreign trade and avoid the inflationary impact on France's internal economy.

"Because the price of certain imported raw materials has gone up 20 per cent is no reason for the price of a carrot or a common household article to go up 5 per cent," he told his nation in a radio address.

He concedes that the battle is psychological and asks the French press to aid him in "the struggle against a fatalistic tendency to believe that both wages and prices are destined to rise."

Gains—M. Gaillard presents figures purporting to show that from Aug. 1 to 14, when foreign trade was conducted at the old rate of 350 francs to the dollar, France had a $110 million deficit with the European Payments Union. After two weeks under the new rate (420 francs to the dollar), he says his nation had built up a credit of $36 million.

He claims that this results only from stopping speculation in francs and that benefits to French exports have not been evaluated. He adds: "The government is determined to apply all its powers to insure that the present realistic level of wages and prices shall be maintained."

Other Problems — French enthusiasm over oil strikes in the Sahara Desert ignores the long step between crude oil in the ground and refined gasoline. Reserves estimated at between 100 million and 300 million tons of oil have been found at Hassi Messaud, 500 miles south of the Mediterranean port of Bougie.

At present, a 6-in. pipeline can move only 500,000 tons a year to a railroad at Toggourt for export to refineries. Increased pipeline, rail, highway, and airfield facilities in the oil field and at the large natural gas deposits on the Tunisian border are in the planning stage.

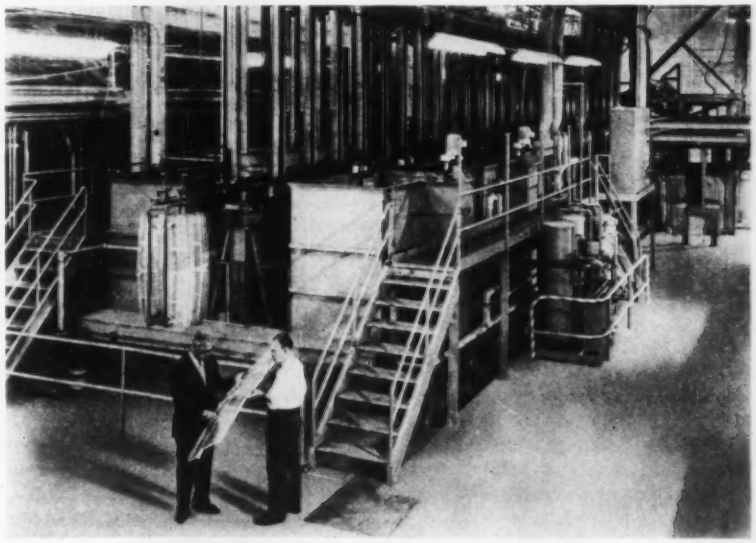
A company has been set up to install iron and steel making facilities to take advantage of Algerian iron ore at Ouerza and its gas and petroleum.

But there's a war on in Algeria, and rebel forces are concentrated along the border. Development of these resources would involve military as well as engineering operations.

Alcan Markets 'T' Ingot

Aluminum ingots cast as a rectangular "T" weighing 1500 lb are being shipped to customers by Aluminum Co. of Canada. Dimensions: 3 ft 4 in. long, 2 ft 9⅝ in. wide, 1 ft 2 in. deep. Base of the "T" is 1 ft 9¾ in. wide.

The ingots are direct chill cast to minimize trapping of moisture and dirt in shrinkage cracks. Alcan cites four advantages to customers: 1. The shape makes it easier for material handling equipment to move the ingot. 2. Its weight and low center of gravity make it easier to stack and store. 3. Surface defects are minimized by direct chill casting. 4. It's less likely to be marred or damaged in shipment.



Firestone Anodizes Aluminum Auto Trim

This giant color anodizing machine at Firestone Steel Products Co., Akron, will eventually process household appliances as well as automotive parts. The new, 10,000 sq-ft anodizing section can treat 5000 sq ft of aluminum an hour

Democrats To Pour On Steam in '58

LED by Sen. Lyndon Johnson (D., Tex.), the upper house's majority leader, Democrats on Capitol Hill promise no foot-dragging in legislative affairs next year. Tremendously encouraged by their victory in Wisconsin, the party thinks it has the '58 Congressional elections and the '60 presidential election all but in the bag. A good legislative session next year ("good" because it's "Democratic" lawmaking) will sew up the future for the Democrats, they feel.

Here is a checklist of important Congressional actions coming in 1958:

T-H Will Stand; Welfare Law Will Pass

One of the big reasons for the Wisconsin victory: Wholehearted support by labor. Knowing what side their bread is buttered on, the Democrats will defeat any Republican move to change the Taft-Hartley Act.

On labor racketeering, Sen. John McClellan (D., Ark.) will introduce legislation in January. The Senate Labor Committee has already passed a bill calling for full disclosure of employee welfare plans, including those operated by management. Senator McClellan will push for a similar bill. The bill will be backed by the administration and labor, while some management groups will oppose it. In Washington, Sen. Gordon Allott (R., Colo.), the National Association of Manufacturers, and the U. S. Chamber of Commerce will lead the fight against making management funds equivalent to union welfare funds. A Democratic majority and some Republicans will defeat them, however.

Defense Spending Will Hold Up Tax Cuts

Look for the President to introduce a budget for fiscal 1959 of about $70 billion. That's $1.8 billion less than the original fiscal 1958 budget which caused so much grass roots excitement, but not enough less to keep such economy-minded leaders as Sen. Harry Byrd (D., Va.) from trying to cut it to around $67 billion. Senator Byrd estimates the fiscal 1958 budget was cut to $66.8 billion.

If Senator Byrd gets his wish, increased personal income tax exemptions of $100 per head could come next year, although they might not be effective until January, 1959. Some aid for small business would also be likely.

But other Democrats, notably Sen. Stuart Symington (D., Mo.) and Sen. Henry Jackson (D., Wash.), are extremely worried about the cutback in our defense program. (Incidentally, they are concerned about unemployment, too, some of it in their own states.) So, there will have to be a meeting of Democratic minds on this score: Tax cuts, or no defense cuts?

Look for the economy bloc to win to the extent that Defense Department spending will be held to $38 billion. But the defense bloc will not allow it to go lower than that.

Antimerger, SBA, and Depressed Areas

Three laws should pass next year, which will be billed as help for small business, especially if no important tax cuts are made. Corporations will be required to notify the Justice Department of their intent to merge; the Small Business Administration will become a permanent agency; the federal government will step into communities where unemployment is up by providing additional defense business and some direct relief aid.

All three laws achieved some form of passage this session (through one house or through a committee) and were not passed because of the long hassle on civil rights and budget cuts.

Shift in Defense Procurement Practices?

The House Armed Services Committee will probably pass a bill to limit negotiated contracts and require more competitive bidding through sealed bids. This will also be heralded as help for small business, although practically it may amount to little.

Another area of interest to small businesses: The cut in subcontracting. Sen. George Smathers (D., Fla.) and Sen. Hubert Humphrey (D., Minn.) will team up to require the Defense Department to allot some proportion of military contracts to small firms. This stands a good chance of passage next year, with a continued limit on defense spending.

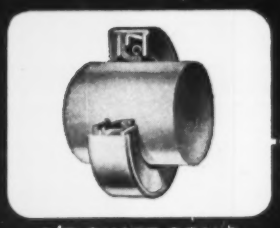
Senator Humphrey says the current cuts are affecting 2680 subcontractors of North American Aviation Inc. alone.

Fiscal Policy, Highways, and Seaway

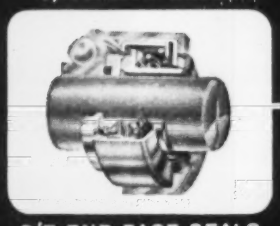
Senator Byrd's Finance Committee will continue its investigation into the nation's monetary policies by bringing the Federal Reserve Board back on the carpet in January. Like Sen. Estes Kefauver's (D., Tenn.) investigation of administered prices, however, committee work will most likely not lead to any legislation. Such hearings are strictly in the area of political sounding boards.

Look for a tough fight to get more money for the St. Lawrence Seaway next year, as the question of tolls hits Congress. Expect 7000 miles to be added to the interstate highway system.

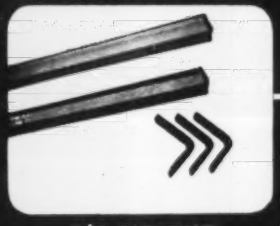
FOR PERFORMANCE PROTECTION



C/R SHAFT SEALS



C/R END FACE SEALS



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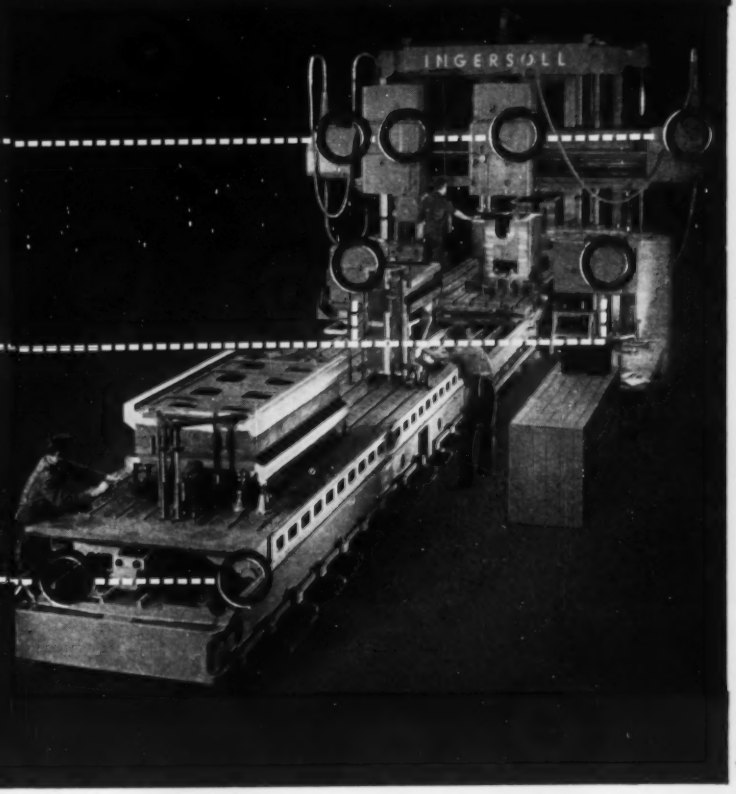

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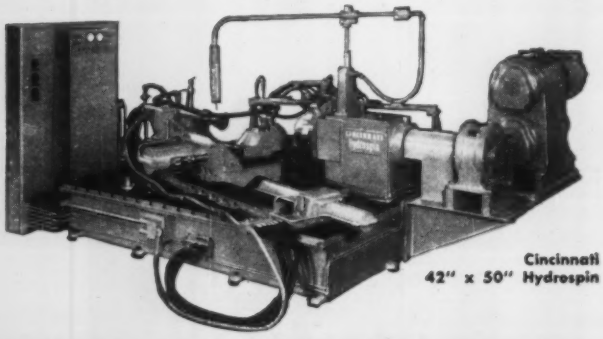

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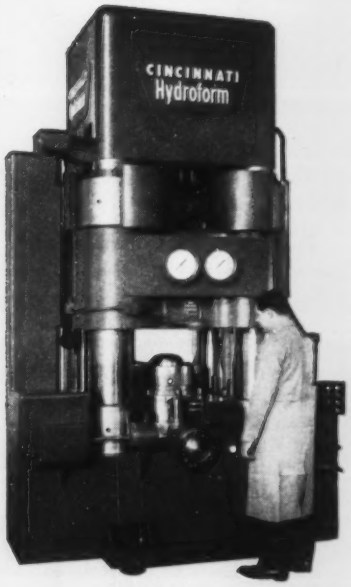

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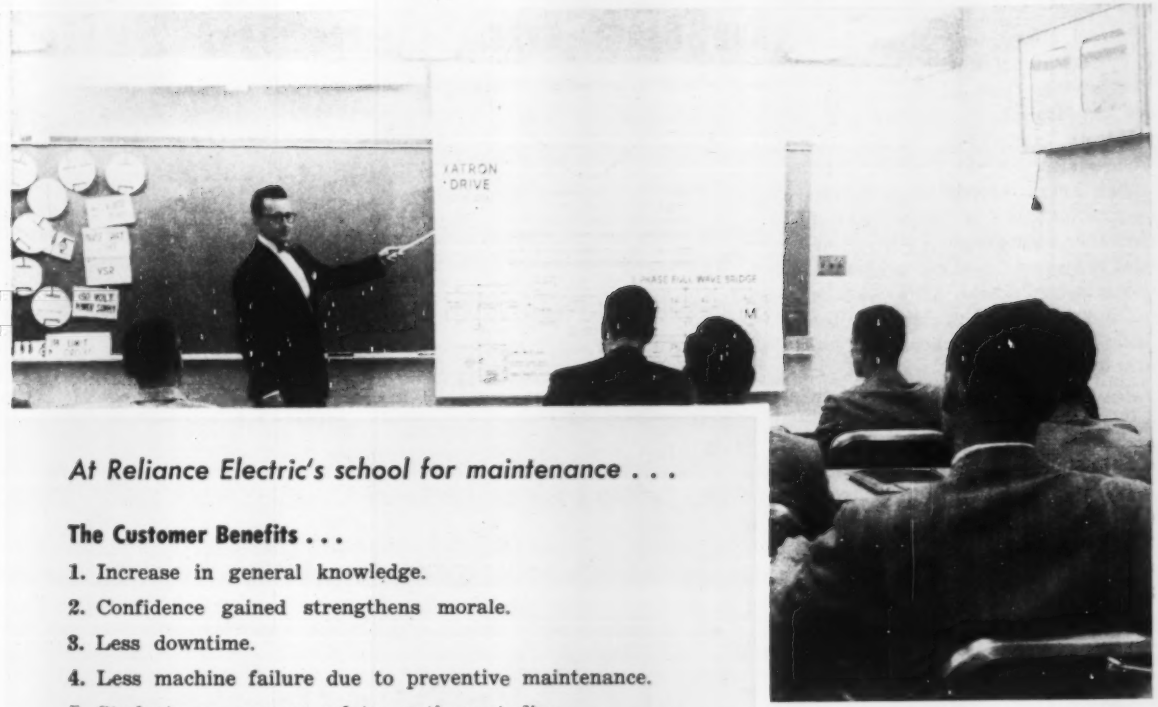


At Reliance Electric's school for maintenance . . .

The Customer Benefits . . .

1. Increase in general knowledge.
2. Confidence gained strengthens morale.
3. Less downtime.
4. Less machine failure due to preventive maintenance.
5. Students are encouraged to continue studies.
6. Knowledge of how to get parts and service correctly from Reliance.

So Does Reliance . . .

1. Fewer service calls by service engineers.
2. Higher customer efficiency.
3. Greater customer satisfaction.
4. Keeps sales engineers selling, not servicing.
5. Learns sources of potential trouble, clues to future needs, and industry trends.
6. Fewer customer grievances.

Students Learn Electronics

GAINING knowledge in preventive maintenance and repair of electronic controls, motors, and drives is the goal of the more than 300 "students" who annually attend Reliance Electric & Engineering Co.'s Customer Service Schools.

The shop electrician who readily repairs manually or mechanically controlled machinery often does not have the knowledge or the confidence to work on electronic controls. So six years ago, Reliance opened a school to teach the principles of electronics to its customers' maintenance men.

How It Grew—Today, a permanent staff, headed by Frank Hrabak, service school director, conducts year round sessions in a 12,000 sq-ft facility, complete with laboratory, three lecture rooms, and an auditorium at the company's new general office building in Cleveland. The average class has 40 students.

School starts at 9 a.m. Monday and closes at 2:30 p.m. Friday. (Students may work in the lab on Saturday.)

What It Teaches—Into these five days are jammed lectures on motor, generator, magnetic amplifier, and vacuum tube theory; explanation of the operation of Reliance's "building blocks" (the electronic components that make up a controller or regulator); and two days of lab work.

Students are quizzed after each section of the course. Material is reviewed before moving on to the next phase. Any student wanting added knowledge to solve a company problem will be tutored by a Reliance application engineer. Special evening and Saturday classes are held for those who need additional help.

What It Costs—There is no charge for tuition; students pay only for lodging, meals, and transportation. Reliance makes motel reservations. It also pays for printed material (valued at $30 per man) used in the course.

The laboratory has enough equipment to accommodate each

student. Each must trouble shoot a control board in a given time. "They feel at home with the equipment by the end of the week," says Mr. Hrabak.

How It Teaches—A former college electronics instructor, Mr. Hrabak keeps interest high by using graphic aids—a 16-mm sound projector, view-graphs, strip film, slide projector, opaque projector, magnetic chalk boards, flip charts, and a pegboard demonstrator for motor control-circuit connection experiments.

The pegboard features a system of lights which flash on if all connections are properly made. In the darkened lecture room, a schematic diagram is flashed onto the blackboard. Using fluorescent colored chalk and black light, Mr. Hrabak parallels the diagram with sketches which glow in the dark.

Written summaries of each lecture are given to the students daily. Course material is almost devoid of promotional matter.

Who May Attend—The only prerequisite for taking the course is interest in the subject. A man with a master's degree in electronics and a newly hired electrical maintenance man often sit side-by-side. Management people also attend. This is their opportunity to become familiar with equipment by working with it in the lab.

The school, a staff function of the firm's Marketing Services Dept., has become so popular that several students recently attended on their vacations. Eleven 5-day sessions are already scheduled for the coming year. More may be added. The 1958 special session for the steel industry is set up for Mar. 10 to 14, while one for machine tool personnel is scheduled for Apr. 7 through 11.

Branches—If a customer company has a large number of students, arrangements can be made for a session at the company's plant. Field engineers sometimes hold evening class sessions for their customers upon request.

The central school staff includes Mr. Hrabak, four members of the intraplant training staff, and two to five application engineers. Special sessions are held for the steel, textile, paper, and machine tool industries.

In the Independent Seller-

Sellers Cite These Major Problems:

1. The manufacturer has no written sales policy.
2. Pricing information is inadequate and profit margins too low.
3. The supplier wants inventories too high and is too tough about stock adjustments.
4. Marketing information about products is too scanty.
5. Too many sellers in an area get the line.
6. Product packaging is unsatisfactory.

Troubles in Distribution

Distributors, mill suppliers, agents, and warehousemen have marketing, money, and manpower problems. Here's how you, the manufacturer, can help buttress our distribution system

THE FIRST SUPPLIER who finds a better way to use our distribution system "will sweep the market," says Economist Peter Drucker.

Marketing experts agree: One potential way to do the sweeping is through better use of the 19,000 independent sellers who will move an estimated $93 billion in manufacturers' goods this year (products for other manufacturers' use—capital equipment and accessories, mill supplies, and metal).

The Problem—Manufacturers and independent sellers are dependent upon each other, but there's too much friction between them (see above).

Manufacturers have difficulty developing a better approach to the independent seller because his industry has a maze of facets. Wholesalers of industrial supplies and equipment (often called mill suppliers) number more than 2000, stocking anywhere from a few lines to 50,000. An estimated 15,000 manufacturers' agents don't stock anything but are private businessmen acting as part-time salesmen for two to a half-dozen manufacturers. In addition, more than 1300 warehouses distribute metal; 240 firms distribute new machine tools—and so it goes.

Suppliers' Solution—A supplier's job is to figure the best way to stimulate the independent sellers to do a better job. Basically, the approach is the same as that for any type of selling organization. It involves closer co-operation with the distributor or agent. Yet, before that can be done, the manufacturer must attend to these problems in his own backyard:

1. Adopt a standard, written policy toward distributors.

2. Protect territories, not necessarily by exclusive agreements,

Manufacturer Relation . . .

Manufacturers Cite These Major Problems:

1. Sellers' inventories are too low.
2. Sellers cover their territories too thinly.
3. Too much sales and technical help is required from us.
4. Sellers' accounting methods are antiquated.
5. Our lines don't get enough attention.
6. Sellers' personnel are inadequately trained.

but at least by assuring each seller that the competition in his area will be reasonable.

3. Appoint an official in charge of relations with sellers.

4. Prepare product literature specifically for sellers' use.

5. Package with the sellers' special circumstances in mind.

Sellers' Solution—The independent seller can stimulate himself to do a better job by looking closer at his own productivity, believes Robert G. Welch, executive vice president of the American Steel Warehouse Association Inc., Cleveland. He suspects that part of the problem with seller-manufacturer relations is that the distributor too often works with his eye on the supplier first. "Look at the customer, first," advises Mr. Welch. "A distributor's job is to sell the customer, not the supplier." And only when the emphasis is in the right direction, will the distributor make great strides in improving productivity. He advises:

1. Study your merchandising, especially the products and services customers want.

2. Use modern accounting systems to learn what true distribution costs are.

3. Look to your manpower—its quantity, quality, and training.

Markets—Mr. Welch and other experts believe that sellers and suppliers can achieve new harmony by jointly working on the marketing problems of their products. Few sellers have the resources for a full-scale marketing job. But the seller often has, and the job can be supplemented by a distributors' trade association, like ASWA, the National and Southern Industrial Distributors' Associations, and American Tool Distributors' Association. (The last three are headquartered in Philadelphia.)

A marketing job should aim at answering questions like these: How can we avoid promiscuous, waste-motion selling by concentrating only on the most profitable customers and products? How can we prepare to meet increased demand for our products 15, 20, or 25 years from now? How can we develop a standard sales policy that makes it clear to both seller and supplier what is and what is not sold through the independent agency? Do customers want more services from the seller, such as maintenance, technical aid, or minor processing?

Money—New harmony between seller and supplier can come via a joint study of profits. Most experts agree that manufacturers are far ahead of distributors in accounting procedures. The supplier can teach his seller plenty. For example—most distributors concentrate on a product with a high gross profit. Yet that item may be far more expensive to sell than one with a low gross but a higher net return. After all, a seller's economic health depends on his net, not his gross.

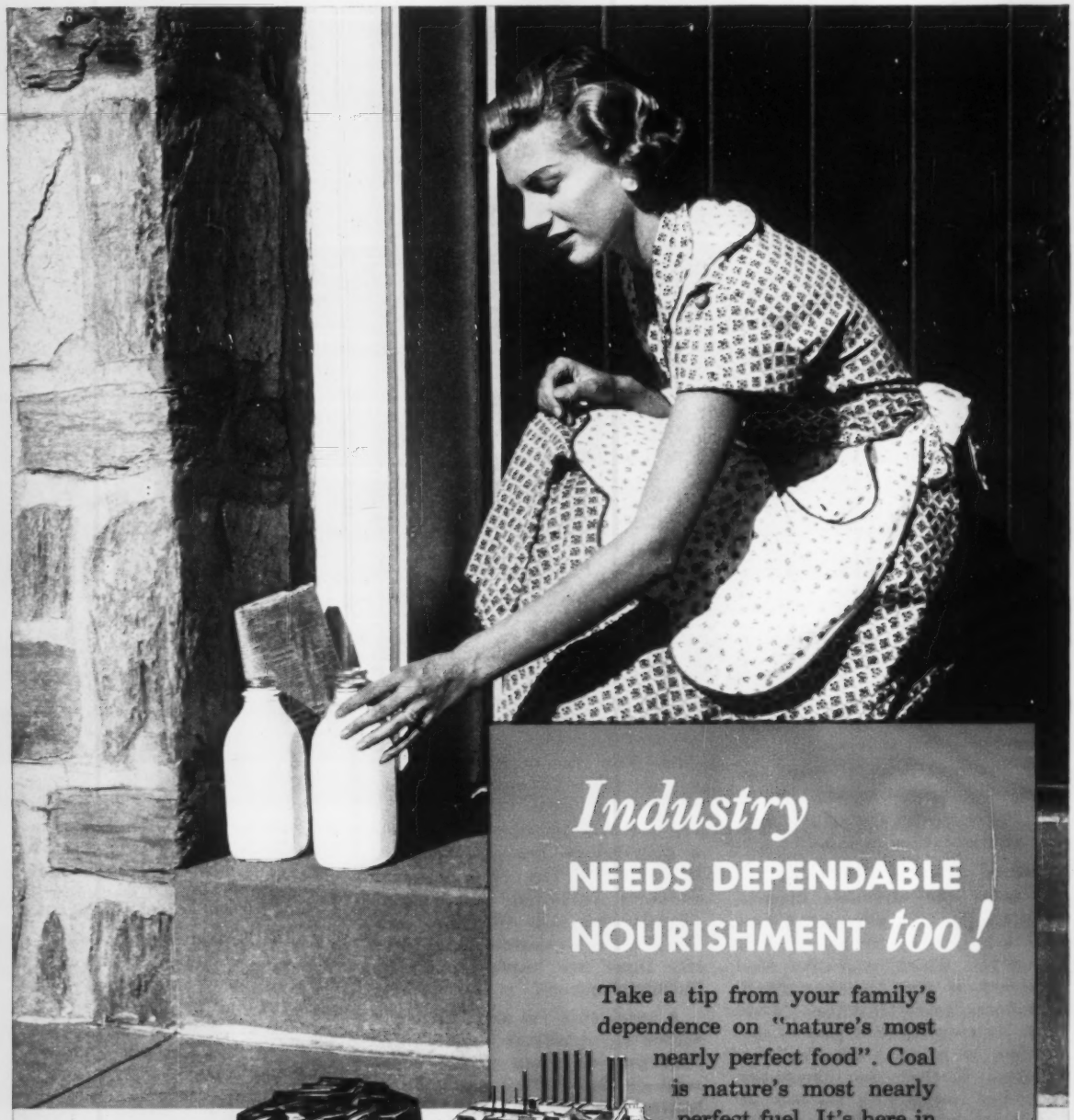
Modern accounting methods can clarify points like that. ASWA has inaugurated a distribution cost analysis system that can be adopted by members. Many have done so and credit it, at least partly, with this improvement in return on net assets, after taxes: 3.5 per cent in 1954 for reporting ASWA members, 8 per cent in 1955, and 13.9 per cent in 1956. Not many segments of the independent selling industry can show gains like that.

Men—Probably the most important spot where the supplier can co-operate with the seller is in manpower. Mr. Welch points out that independent sellers have underestimated their manpower needs. Many a manufacturer has long wrestled with recruiting problems. He can pass along to his distributor some of the points he has learned. He is also likely to be experienced in the realm of personnel relations. So, he can help the seller start a program aimed at keeping the good men he hires.

Finally, the manufacturer can help in the training of the seller's personnel. Republic Steel Corp. has such a program, called Order Makers' Institute. It was first designed for distributors selling pipe, but it has been so successful that the company is considering adapting it for other products. OMI gives information about product use and manufacture. It gives tips on selling techniques. Its basic point: We have plenty of capacity to produce almost anything; now we have to sell it.

Industry must sell much of what it produces through independent sellers. That part of our distribution system has weak points. Help in strengthening them, and you may be able to "sweep the market."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



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California Division of Highways

SAE Investigates Smog

A Los Angeles study shows how stop-and-go driving habits, necessitated by traffic conditions, contribute to air pollution. Average downtown speed: 13 mph

MEDICAL experts have warned us that regular exposure to exhaust gases in heavy traffic may lead to lung cancer. Now, the Society of Automotive Engineers tells us that unburned hydrocarbons (combustion byproducts) from auto and truck exhausts make up a goodly portion of the ingredients that go into smog.

Among the conclusions reached by the SAE in a study of Los Angeles traffic is that an engine operating at cruising speed emits fewer unburned hydrocarbons than when it's accelerating. How much time a driver speeds accelerating, cruising, or idling directly affects how many hydrocarbons escape to join smog. So does the speed at which he travels, the type of traffic in which he drives, and the kind of car he operates.

Society engineers figure eventually this information will help them determine which muffler, manifold, and cylinder designs will eliminate the most hydrocarbons under average driving conditions.

Makes Study—That's the reasoning behind the "Los Angeles Traffic Pattern Survey" which the SAE released last month.

Here is a summary of the results:

- The average Los Angeles driver spends 15 per cent of his driving time idling at stop lights and in traffic jams.
- Another 16 per cent is spent cruising at about 30 mph.
- Mr. L. A. is accelerating 37 per cent of the time he's on the highway and decelerating 32 per cent of the time.

That's when most of the hydrocarbons escape.

The typical Los Angeles driver averages only 49 mph on freeways with light traffic. In downtown traffic he moves at 13 mph. Fuel economy ranges from 17 to 10 mpg.

The study also indicates cars with automatic transmissions make for less hydrocarbon emission than those with straight sticks.

Look Ahead—While all this activity may or may not result in less smog, it does provide more information about a subject on which little is known.

And, incidentally, it tends to prove California drivers are meeker than commonly is suspected.

Ford Gets Contract

Ford Motor Co. has been awarded a $1.3 million contract to engineer a ¼-ton utility truck for the military forces.

The special military vehicles office, Ford engineering staff, is developing drawings preparatory to issuing production contract bids.

The contract brings the total value of FMC defense engineering and development contracts in the Detroit area to $8.5 million.

Since 1952, the company has de-

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signed and built ten prototypes of the ¼-ton truck which is called the XM 151.

The last four prototypes had unitized bodies; two were aluminum. It's understood the present contract calls for steel unitized construction.

Exhaust Notes

• American Motors Corp. is the first automaker to agree to a one-stop system for collecting SUB payments. AMC follows the lead of Doehler-Jarvis Div., National Lead Co., Toledo, Ohio (see STEEL, Aug. 26, p. 35).

• Studebaker-Packard dealers report a 66 per cent increase in profits during the second quarter of 1957, compared with first quarter earnings.

• Rumor has it the Oldsmobile will bring out an entirely new engine in '59. It will have the largest block in the industry, according to one report.

• An aluminum company is dickering with one of the ultrasonic firms. Objective: To make prototypes of an ultrasonically welded, all aluminum radiator.

• Henry Ford II, president, FMC, confirms that '58 car prices will increase. Estimates range from $30 to $60.

U.S. Auto Output

	Passenger Only 1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
August	522,000	402,575
8 Mo. Total	4,390,517†	4,044,052
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808
Week Ended	1957	1956
Aug. 3	119,323	111,157
Aug. 10	118,864	108,167
Aug. 17	117,598	98,348
Aug. 24	123,130	69,676
Aug. 31	117,324†	58,166
Sept. 7	110,000*	47,771

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

STEEL Checks Edsel

• Ford's Edsel has been in dealer showrooms almost a week.

The feeling is Edsel will have little trouble in selling 200,000 units in '58. It probably could dispose of that many on novelty alone, so the real sales test won't come until '59 and '60.

Speculation in the industry indicates Edsel will penetrate Dodge, De Soto, and Mercury for most of its sales. Studebaker, Olds, and Buick are apt to be pinched also. Pontiac and Chevy probably will be hurt the least since they're completely restyled.

We've had a chance to drive the Edsel Pacer long enough to get an idea of how the car shapes up in performance.

The Pacer weighs about 3750 lb and handles much like a Dodge or Pontiac. Front end dip is extremely slight during stops, but cornering leaves something to be desired. There's a tendency to drift out at the rear on turns above 30 mph.

It's understood the car's chassis is designed basically for air suspension. When this is incorporated later this year, the Edsel should improve on turns and over the bumps.

The automatic transmission is smooth although there's a little hesitation in the first step. Edsel sports a convenient set of electrically actuated shift buttons set in the steering wheel hub. An inhibitor switch prevents accidentally jamming the transmission in park or reverse at speeds above 3 miles an hour.

Over the highway, gas economy averages about 17 mpg, say the drivers.

The brakes should take a dozen hard, repetitive stops from 60 mph before they fade out. A ratchet screw on each set of brake shoes automatically compensates for lining wear.

Departing from handling, we noticed little aluminum or stainless exterior trim on the Edsel although Aluminum Co. of America points out the car contains some 50 lb of aluminum.

The vertical grille is a chrome-plated zinc diecasting. Parts of the wheel covers are stainless.

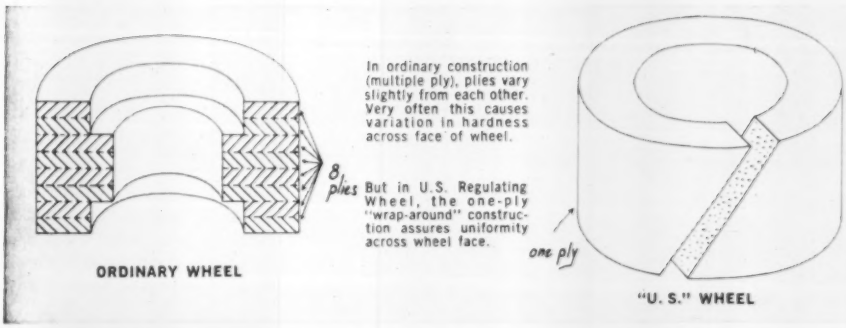
Ranger and Pacer cars are built on 118 in. wheelbases and are 213 in. long. They're 56.4 in. high and are powered by the E-400 engine, with 361 cu-in. displacement and 400 ft-lb of torque at 303 hp. Corsair and Citation Edsels weigh about 4000 lb and are built on a 124-in. wheelbase, with a total length of 218.8 in.

The E-475 engine which powers them has a three-stage cooling system which should add to engine life and performance. Neither engine has fuel injection.

VULCANITE REGULATING WHEEL

3 Molding Methods make "U.S." Wheels the pace-setters

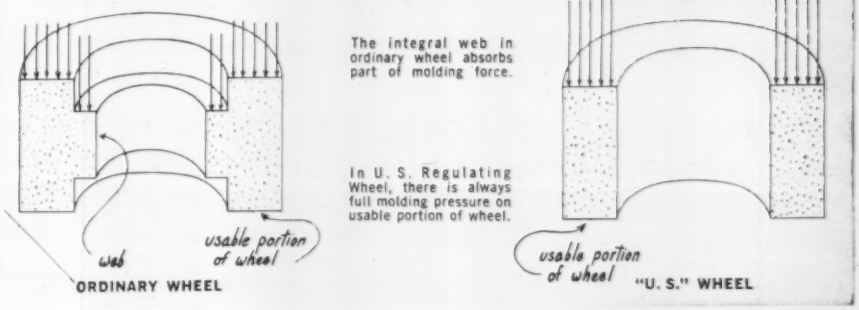
Unmatched Uniformity



In ordinary construction (multiple ply), plies vary slightly from each other. Very often this causes variation in hardness across face of wheel.

But in U.S. Regulating Wheel, the one-ply "wrap-around" construction assures uniformity across wheel face.

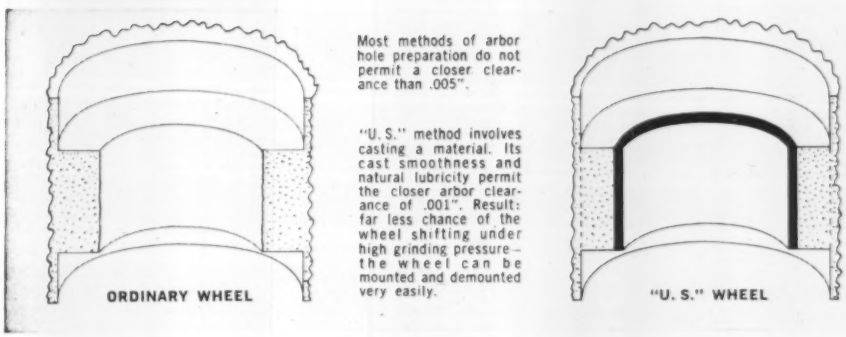
Full Molding Pressure



The integral web in ordinary wheel absorbs part of molding force.

In U. S. Regulating Wheel, there is always full molding pressure on usable portion of wheel.

Arbor Clearance of .001"



Most methods of arbor hole preparation do not permit a closer clearance than .005".

"U. S." method involves casting a material. Its cast smoothness and natural lubricity permit the closer arbor clearance of .001". Result: far less chance of the wheel shifting under high grinding pressure—the wheel can be mounted and demounted very easily.

Years of careful study of customers' needs resulted in creation of this U.S. Vulcanite Regulating Wheel. It has high resistance to wear, and precisely the right degree of traction and cushion. Less infeed is required, enabling the operator to hold size better. *Yet, U. S. Vulcanite Regulating Wheels cost no more than ordinary wheels.*

Write to Grinding Wheel Sales Department, United States Rubber, 4300 New Haven Avenue, Ft. Wayne 4, Indiana.

Mechanical Goods Division

United States Rubber

SEE THINGS YOU NEVER SAW BEFORE. VISIT U. S. RUBBER'S NEW EXHIBIT HALL, ROCKEFELLER CENTER, N. Y.

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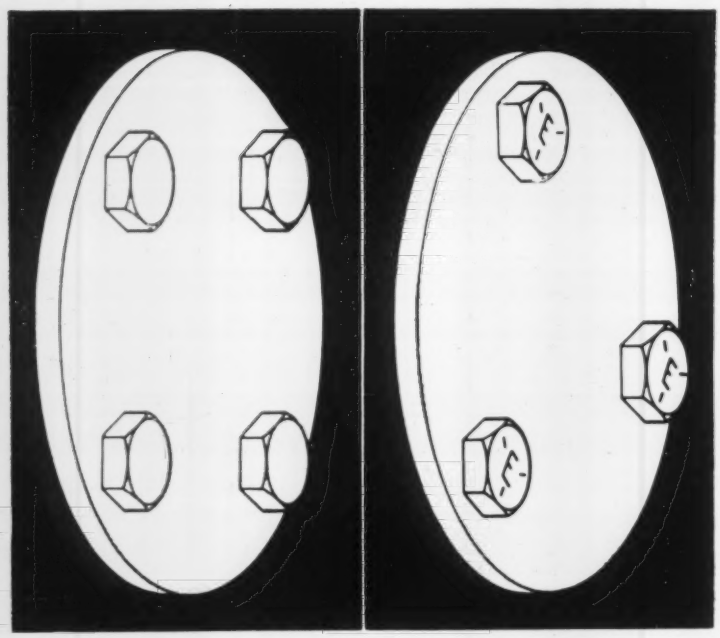


SIMPLE CHANGE SAVES UP TO 40% ON FASTENER COSTS

● High strength bolts deliver more "holding power" per dollar

● Savings in production can also be realized

Figure the cost of fasteners as if you're buying *clamping force* to hold together an assembly. This way, $1.65 worth of "holding power" in machine bolts costs you only $1.50 if bright cap screws are used . . . but only $1.00 in high carbon bolts.

Viewed another way, it means that the stronger fastener can be smaller for a given application, and so costs less. Or it can mean using fewer fasteners.

Either way, you save. On direct fastener costs; on manufacturing. With *smaller* fasteners, there are smaller holes to drill (or maybe you can even go to punching). With *fewer* fasteners, there are fewer holes to fill. (In the sketch above, fastener assembly time would be cut one-fourth.)

• **Case History:** Where an application is suited to high strength bolts the savings can be substantial. One Midwest farm equipment plant that standardized on them saved $12,000 the first year, $28,000 the second.

Manufacturers willing to review their requirements with an RB&W Fastener Man may find it rewarding. He's a technical specialist who can help you save money in assembling your products with standard fasteners. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N.Y.

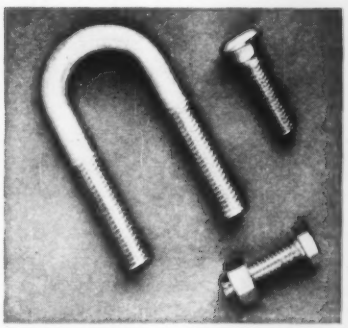
R B & W
112th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

Spin-Lock Screws solve assembly problem

The designer specified countersunk-head screws to be used in a particular casting. The production man had to stake these in to anchor them. But this meant extra operation, made screw removal damaging and difficult.

The answer was found in Spin-Lock screws. These have hardened "ratchet-action" teeth that bite in when tightened, take 20% more torque to loosen than to tighten, can be reused. Send for Bulletin.

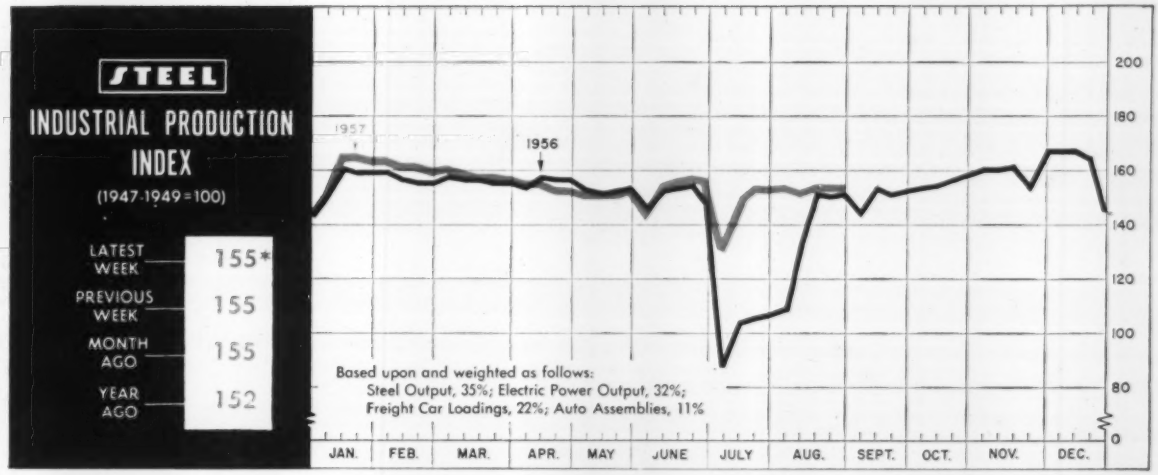


Silicon bronze fasteners combine desirable features

Silicon bronze offers the highest conductivity in fasteners able to withstand high stresses. It resists corrosion, stays free from season cracking, too. It makes ideal fasteners for electrical use where tensile strength is important; or for corrosive environments.

One of the first to develop such fasteners, RB&W cold works them for tensile strength and for clean, well formed threads that don't seize. Oval bolts, hex bolts and nuts, and U bolts available. Specials can be developed.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Aug. 31.

Production Trends To Rise After Seasonal Dip

STEEL'S industrial production index is about to take a nosedive, but there is nothing to get excited about. It happens every year as a prelude to the fourth-quarter buildup. The chief factor is the model changeover in motordom, but output of electric energy is credited with an assist.

Currently riding three or four points above the year-ago level, STEEL's index probably will maintain that edge until at least late in November. Preliminary tabulations for the last week in August show that the index remained at 155 (1947-49 = 100) for the third straight week, giving that month a record average of 155.

Labor Day Effects—When final figures are in for the Labor Day week, the trend line will tumble to a little above the year-ago reading of 145. The rebound is expected to be sharper than in 1956 because the auto industry is phasing out old model production on a stronger note than it did last year. Several of the smaller producers already have halted production on '57s and started on '58s. This last week marked the beginning of changeover at some Chrysler Corp. plants. Next week some General Motors Corp. divisions will join the pack. But the two biggest volume producers—Ford and Chevrolet—will produce well into September.

According to *Ward's Automotive Reports*, production for the fourth quarter is being scheduled at 1,559,200 cars, just 7893 units below last year's fourth quarter. The buildup in October should be smoother than it was last year because fewer completely new models are involved.

September is also a relatively poor month for the nation's electric utilities. Use of air conditioners is past its peak, and industrial use is still below the peak volume of November and December. But the steady growth of this industry has been the biggest factor this year in maintaining an edge over 1956,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,116[1]	2,103	2,429
Electric Power Distributed (million kw-hr)	12,100[1]	12,023	11,565
Bituminous Coal Output (1000 tons)	9,875[1]	9,600	9,829
Petroleum Production (daily avg—1000 bbl)	6,800[1]	6,788	6,959
Construction Volume (*ENR*—millions)	$436.5	$257.7	$616.6
Auto, Truck Output, U. S., Canada (*Ward's*)	142,506[1]	149,867	77,371
TRADE			
Freight Car Loadings (1000 cars)	759[1]	758	784
Business Failures (Dun & Bradstreet)	260	222	215
Currency in Circulation (millions)[3]	$30,998	$31,055	$30,618
Dept. Store Sales (changes from year ago)[3]	+1%	+4%	+8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,492	$21,835	$19,965
Federal Gross Debt (billions)	$273.7	$271.4	$275.4
Bond Volume, NYSE (millions)	$17.6	$17.0	$15.0
Stocks Sales, NYSE (thousands of shares)	9,998	9,922	8,032
Loans and Investments (billions)[4]	$87.0	$85.9	$85.9
U. S. Govt. Obligations Held (billions)[4]	$25.3	$24.6	$26.9
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.71
STEEL's Nonferrous Metal Price Index[6]	213.7	213.8	262.5
All Commodities[7]	118.0	118.0	114.6
Commodities Other Than Farm & Foods[7]	125.6	125.7	122.3

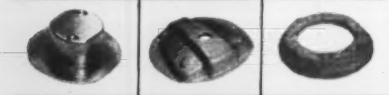
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

FAST

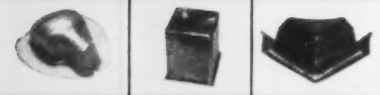
PRODUCTION OF NEW PRODUCT *Fabrications* FOR QUICK DELIVERY OF *Spinformings*

GUIDED MISSILES, TURBO JETS,

COMMERCIAL PLANES, PARTS, *Hydroformings*



INDUSTRIAL PRODUCTS AND A



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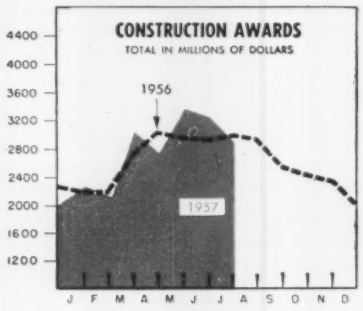
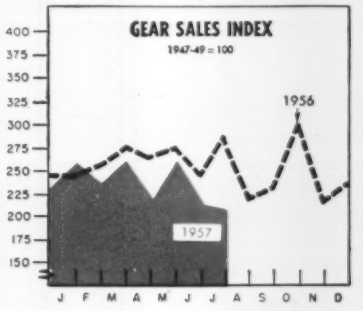
ENGINEERING REPRESENTATIVES IN MANY CITIES

THE BUSINESS TREND



	Total		Building	
	1957	1956	1957	1956
Jan.	2,299.6	2,221.1	1,730.7	1,596.5
Feb.	2,161.0	2,229.5	1,695.5	1,694.9
Mar.	3,078.0	2,769.5	2,199.7	2,250.3
Apr.	2,776.4	3,045.5	2,069.7	2,392.2
May	3,399.5	2,980.2	2,416.8	2,317.3
June	3,243.5	2,947.5	2,341.5	2,226.5
July	2,900.7	3,013.0	2,247.6	2,217.5
Aug.	.....	2,953.3	.....	2,157.7
Sept.	.....	2,575.1	.....	1,977.6
Oct.	.....	2,443.0	.....	1,914.6
Nov.	.....	2,377.3	.....	1,869.3
Dec.	.....	2,057.2	.....	1,455.6
Totals	.....	31,612.2	.....	24,070.0

F. W. Dodge Corp.
Charts copyright, 1957, STEEL.



	1957	1956	1955
Jan.	259.3	245.5	140.9
Feb.	239.5	256.2	148.5
Mar.	262.4	276.5	172.8
Apr.	221.7	264.7	179.8
May	263.2	275.6	205.2
June	215.9	245.4	193.5
July	211.4	286.7	201.7
Aug.	....	219.5	217.6
Sept.	....	230.5	246.5
Oct.	....	299.8	227.6
Nov.	....	216.2	210.4
Dec.	....	235.7	245.5
Avg.	....	254.4	198.3

American Gear Mfrs. Assn.

and September will be no exception. An upturn starting in October will help counterbalance the easing in auto production.

Steel Output Rising—Demand for steel is strengthening, output having increased every week since the July 4 holiday. Bookings from automakers and appliance producers (see Page 63) are uptrending, but the improvement is not confined to these groups. September should continue slightly above the August rate, then show significant weekly increases in October, which is traditionally one of the best months of the year. November should be as good.

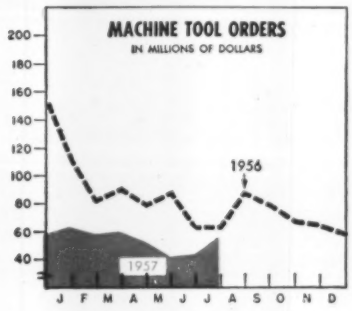
Freight car loadings, which have been far below expectations this year, should show some seasonal improvement in October and November as the Great Lakes shipping season nears its end. But it is unlikely that the railroads will match their 1956 performance, resulting in a deficit in that segment of the production index.

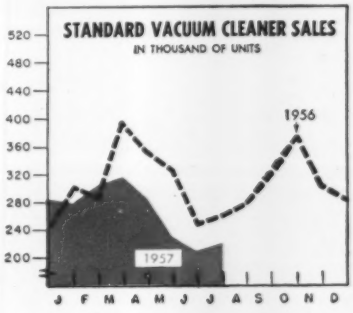
Sum Total—The trend of industrial production should start climbing after Labor Day and continue upward for at least another two or three months, with a possible leveling out around the first of December at near record levels.

Construction Seesaws

If weekly construction award figures for this year were plotted, the trend line would resemble the cutting edge of a handsaw. *Engineering News-Record* reports a total of $436.5 million for the week ended Aug. 29. The week before, it was $257.7 million, preceded by $411.9 million. This is in sharp contrast to the 1956 trend which showed remarkable stability at high levels. The net result: While 1957 has had some good weeks, it is still about 15 per cent behind 1956 through the first 35 weeks of both years. The score to date: 1957—$12.84 billion; 1956—$15.027 billion.

July was not a particularly good month for the construction industry, partly because of the strike in the cement industry. The value of new construction put in place came to $4.4 billion, slightly higher than in June but fractionally lower than July, 1956. Seasonally adjusted, July was off 2 per cent from June, according to figures of the Commerce and Labor Departments. Construction is still headed for a good year, but it may fall short of the 1956 record, at least in volume.





(Thousands of Dollars)

	New Orders 1957	New Orders 1956	Shipments 1957	Shipments 1956
Jan.	63,250	109,550	76,550	54,600
Feb.	58,200	81,300	77,700	64,600
Mar.	58,900	89,500	89,100	74,150
Apr.	51,300	79,300	87,800	71,800
May	41,400	87,100	78,500	76,800
June	43,100	61,850	82,950	76,250
July	55,850*	61,900	58,500*	65,150
Aug.	.....	87,500	.....	75,100
Sept.	.....	78,450	.....	71,100
Oct.	.....	66,100	.....	89,750
Nov.	.....	64,250	.....	81,700
Dec.	.....	57,200	.....	85,150
Totals	.....	924,000	.....	886,150

*Preliminary.
National Machine Tool Builders' Assn.

	1957	1956	1955
Jan.	276,738	302,203	248,941
Feb.	300,887	286,386	261,183
Mar.	312,746	395,686	356,444
Apr.	281,627	352,873	241,870
May	231,246	326,008	255,941
June	207,286	248,326	239,728
July	218,276	259,774	206,758
Aug.	.....	276,932	252,691
Sept.	.....	320,278	306,507
Oct.	.....	371,998	349,654
Nov.	.....	300,381	307,267
Dec.	.....	281,025	243,457
Totals	.....	3,721,870	3,270,441

Vacuum Cleaners Mfrs.' Assn.

More ominous is the drop in contracts for future construction as reported by F. W. Dodge Corp. July dipped to $2,900,681,000, about 4 per cent below the year-ago month. Dun & Bradstreet Inc. says that building permits for July fell below the comparable year-ago period for the third month in a row. While uncertainty about cement supplies may have tempered construction plans to a degree, it is doubtful that this is the main cause of these declines.

Industry Growth Charted

In a study of growth patterns in manufacturing industries, the Department of Commerce confirms a long suspected belief that the transportation segment is leading the pack, and by a good margin. From 1947 to 1954, it showed a gain of 45.1 per cent in employment, well ahead of the 20.4 per cent marked up by the No. 2 group, electrical machinery. Of the 20 S.I.C. major industry groups, 13 showed gains while seven showed decreases in employment. Two metalworking groups showed declines —nonelectrical machinery (−0.7 per cent) and primary metal industries (−3.5 per cent). However, nonelectrical machinery is still the third largest employment group. The growth factor for all manufacturing was 7.6 per cent. Instruments and related products topped that with 11.3 per cent, while fabricated metal products (4.8 per cent) and miscellaneous manufactures (5.2 per cent) fell below it.

Trends Fore and Aft

- During the first seven months of this year, 3749 utility and executive aircraft were shipped by eight U. S. manufacturers, states Aircraft Industries Association of America Inc. They were one to ten-place planes with a total value of over $61 million. July shipments totaled 454 complete aircraft, including 391 four-place and 63 one and two-place planes valued at about $7.8 million.

- The first steps have been taken in a planned 1300-mile natural gas pipeline from Alberta, Canada, to California.

- Henry Ford II, president of Ford Motor Co., has scaled upward his estimate of 1957 new car sales from 5.8 million to 6 million.

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WELDING ROD CLINIC

J. Imperati and R. F. Pulver, Welding Engineers
The American Brass Company, Waterbury, Conn.

Modern methods of welding copper

In the past, most users have had difficulty welding copper because of its high heat conductivity. This has been especially true with oxyacetylene welding which is so slow, costly, and laborious that it often discouraged attempts to weld heavy copper.

PROBLEMS: Arc welding, with its concentrated heat source and high rate of energy input, would minimize the difficulties, and a practicable arc process has long been sought.

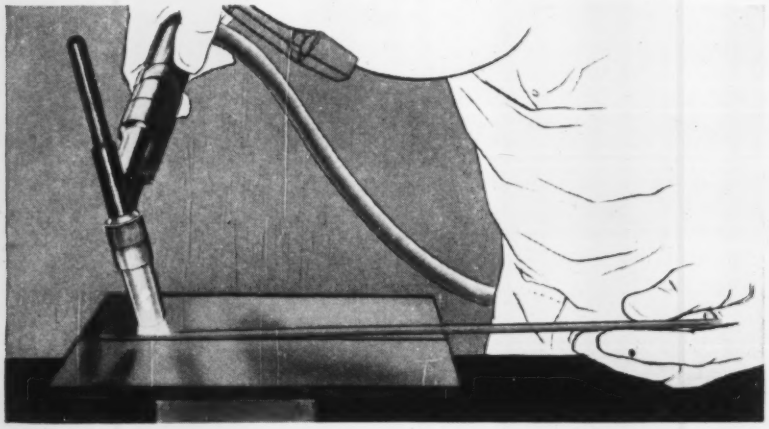
Unfortunately, fluxed electrodes have limited current-carrying capacities and melt with violent and erratic arc action, so that control is poor and spatter loss is high. Preheat levels about 1200°F are usually required to obtain even moderately good performance. Furthermore, most applications on equipment for the chemical industry require weld metal with copper content as high as possible. The usual electrodes which have core wires of copper-tin or copper-silicon alloy are not suitable. Electrodes with copper core wires make welds with high porosity and low mechanical properties.

The other usable method has been the carbon-arc process, but since it offers no protection from the atmosphere it does not produce sound welds with copper filler rods, and the highly alloyed filler metals must be used in order to obtain suitable mechanical properties.

THE SOLUTION: By contrast, the modern inert-gas-shielded-arc processes eliminate the atmosphere as one source of poor weld quality, and offer reasonable welding speeds with only moderate preheat. In addition, it is possible to produce welds of almost pure copper with excellent physical and mechanical properties by using filler metal of Anaconda Copper-372. Countless applications of this filler metal with these processes have demonstrated that arc welds with superior properties are readily attainable.

Anaconda Copper-372 Welding Rod makes welds of exceptional soundness with the highest mechanical properties possible. Welds made with it on Phosphorized Copper meet the requirements of Section VIII of the ASME Boiler and Pressure Vessel Code, and do so without the costly hot-working formerly needed.

Anaconda Copper-372 is widely employed in the production of pressure vessels and other equipment for the chemical and heat-exchanger industries. It is supplied as straight rods for inert-gas-tungsten-arc welding and as coiled wire for the inert-gas-consumable-electrode process. Suggestions for preparation, preheat, shielding gas, etc., are given in Publication B-13. We will gladly send you a copy and answer questions on the welding of copper. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 57108



Inert-gas-tungsten-arc welding of copper plates ⅜" thick with Anaconda Copper-372 Welding Rod, using the forehand position with a slight weave and a short arc. Edges of copper are partially beveled at 45 degrees. Backing is essential, so the edges are beveled only part way and are tightly butted. After welding is done on the beveled side, root is chipped out to sound metal and welded to complete the joint. Finished weld has full strength without peening or annealing.

ANACONDA®
Welding Rods
made by
The American Brass Company

ROBERT E. DAVIES
Blaw-Knox div. post

MARQUIS P. ORR
Mackintosh-Hemphill post

CHESTER A. SELLEN
Reliance Div. gen. mgr.

RICHMOND P. HOBSON
Universal-Cyclops works mgr.

Blaw-Knox Co., Pittsburgh, appointed **Robert E. Davies** as manager of production for its power piping and sprinkler division. He was construction superintendent for the chemical plants division.

Marquis P. Orr was appointed manager of roll sales for **E. W. Bliss Co.'s** Mackintosh-Hemphill Div., Pittsburgh. He was assistant manager of roll sales.

Donald A. Levine was elected a vice president, **Great American Industries Inc.**, Elyria, Ohio. He continues as general manager of the Rubatex Div., Bedford, Va.

N. W. Blakely was named assistant general manager of **Wheeling Steel Corp.'s** Benwood, W. Va., Works. Since 1955 he has been in charge of the construction program at the Steubenville and Yorkville, Ohio, plants.

Edwin P. Schrank was appointed manager of production and engineering at **Seiberling Rubber Co.**, Akron. He fills a position created following the election of **A. L. McMullen** as vice president in charge of production at Seiberling Rubber Co. of Canada Ltd. Mr. McMullen was manager of production at Seiberling in Akron.

Theodore C. Norris was named Cleveland district sales manager, **American Steel & Wire Div.**, U. S. Steel Corp., Cleveland. He succeeds **Charles H. Eisenhardt**, promoted to eastern area sales manager in New York, replacing **Roswell F. Curtis**, who is on leave.

Chester A. Sellen was made general manager, **Reliance Div.**, Eaton Mfg. Co., Massillon, Ohio. Formerly assistant general manager and chief metallurgist of the division, Mr. Sellen succeeds **E. D. Cowlin**, retired.

Charles W. Iams was appointed an assistant vice president, industrial engineering of **United States Steel Corp.**, Pittsburgh. **John A. Eckel** succeeds Mr. Iams as assistant to the general manager, operations-steel.

W. Glenn Williams was made engineer in charge of induction and dielectric heating sales, electrical application department, **Allis-Chalmers Mfg. Co.**, Milwaukee.

Donald F. Taylor was named general manufacturing manager, **Buick Motor Div.**, General Motors Corp., Flint, Mich. He succeeds **Jesse L. Powers**, retired. **Oliver K. Kelley** was made chief engineer to succeed **Verner P. Mathews**, who retires Jan. 1.

Martin J. Caserio succeeds **Warren E. Milner** as manager of Milwaukee operations, AC Spark Plug Div., **General Motors Corp. Glen R. Fitzgerald** succeeds Mr. Caserio as director of engineering and equipment sales for the Flint, Mich., plants. **Leo W. Tobin Jr.** was made chief automotive engineer to succeed Mr. Fitzgerald. Mr. Milner becomes general manager, Hyatt Bearings Div., Harrison, N. J., to replace **D. L. Boyes**, now general manager of Delco-Remy Div., Anderson, Ind.

Richmond P. Hobson was appointed works manager for the new stainless steel plant to be built at Coshocton, Ohio, by **Universal-Cyclops Steel Corp.** He was manager of the bar, wire, and strip mills at the Bridgeville, Pa., plant.

C. M. Hause was appointed Los Angeles district sales manager; **E. P. Newsted**, San Francisco district sales manager of American Chain & Cable Co. Inc.'s new **R-P&C Valve Div.**

Federal Pacific Electric Co., Newark, N. J., promoted: **M. J. St. John** to manager, distributor products department, Newark division; **G. E. Benson** to manager, general products department; **J. T. Donahue** to product manager, regional plant apparatus; **G. A. Dusch** to product manager, switchgear apparatus; **C. A. Schmidt** to manager, industrial products department, Newark division.

Geo. P. Reintjes Co. named **John F. Wooler Jr.** as Chicago divisional sales manager.

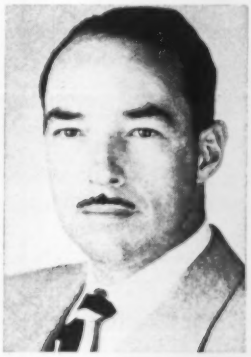
Ceco Steel Products Corp., Chicago, named **Ward Dobbin** assistant manager for structural products; **Claude Carmichael**, assistant manager for window and door products.

Fred E. Theis was made superintendent of shops; **Norman P. Hitchcock**, superintendent of maintenance and power at the Indiana Harbor, Ind., Works of **Youngstown Sheet & Tube Co. Ernest W. Polley** was made chief

DR. LYMAN R. FINK
GE x-ray dept. gen. mgr.

ALLEN E. HERMANSON
Sundstrand machine tool mgr.

CARL LUDWIG
Wellman Eng. div. chief eng.



WILLIAM L. PRINGLE
Hercules Motors president

chemist of the Youngstown district to succeed the late **L. C. Flickinger.**

General Electric Co. appointed **Dr. Lyman R. Fink** general manager of its x-ray department at Milwaukee. He succeeds **John H. Smith,** recently resigned to accept a post on the faculty of the University of Wisconsin at Milwaukee, School of Business Administration. Dr. Fink was manager of research application at GE's research laboratory in Schenectady, N. Y.

John E. Chadwick, sales manager of **Koehring Div.,** Milwaukee, excavator manufacturing division of Koehring Co., succeeds the late **John S. Conway** as vice president and sales manager, in charge of sales, service, and sales promotion.

Thomas P. Styslinger was made assistant plant manager of the Trenton, N. J., plant of U. S. Steel Corp.'s **American Bridge Div.**

David E. Weaver was made superintendent; **Charles N. Treat,** assistant superintendent at **Republic Steel Corp.'s** South Chicago, Ill., plant.

Victor F. Perreault was named regional sales manager, **Behr-Manning Co.,** at Albany, N. Y. He is succeeded as industrial trade sales engineer by **Thomas G. Gilcoyne.**

Robert E. Young was made U. S. sales manager of **Aluminium Ltd. Sales Inc.,** New York, sales subsidiary of Aluminium Ltd., Canada.

John L. Thoman was made division industrial engineer in **Jones & Laughlin Steel Corp.'s** stainless steel division at Warren, Mich.

Allen E. Hermanson was made manager of the machine tool divisions in Belvidere and Rockford, Ill., for **Sundstrand Machine Tool Co.** He was assistant manager.

Carl Ludwig was made chief engineer, Engineered Products Div., **Wellman Engineering Co.,** Cleveland, an affiliate of McDowell Co. Inc. With Wellman since 1956, Mr. Ludwig's former positions include chief engineer with the rolling mill division of Winchester Arms, Olin Mathieson Corp., and with the Adamson Div. of Hydropress Inc.

Fred E. Everett was made manager, marine and transportation section, **Westinghouse Electric Corp.,** East Pittsburgh, Pa.

International Resistance Co. appointed **Henry Schumer** chief engineer of its Asheville, N. C., plant; **James Wilkes,** manager of quality control, Philadelphia plant.

Carl K. Wolff joins **W. S. Shamban & Co.** at Culver City, Calif., as western regional sales manager. He was senior sales engineer and division product co-ordinator of National Seal Div., Federal-Mogul-Bower Bearings Inc.

Clifford A. Faust was appointed director of technical services, **Consolidated Electrodynamics Corp.,** Pasadena, Calif. He succeeds **Harold F. Wiley,** recently named director of the new analytical and control instruments division.

Hycon Mfg. Co., Pasadena, Calif., appointed **Matthew J. Leonard** vice president-customer relations.

William L. Pringle was elected president, **Hercules Motors Corp.,** Canton, Ohio, to succeed **John C. Keplinger,** who continues as an executive consultant. Mr. Pringle assumes his duties Oct. 1. He was director of engineering, Long Mfg. Div., Borg-Warner Corp. **Henry H. Timken Jr.,** chairman of Timken Roller Bearing Co., was elected chairman of Hercules Motors. He succeeds **Charles Balough,** who will resign Oct. 1.

Thomas M. Everhard was made Detroit district sales manager for the steel and tubes division of **Republic Steel Corp.** He succeeds the late **Robert E. Doyle.**

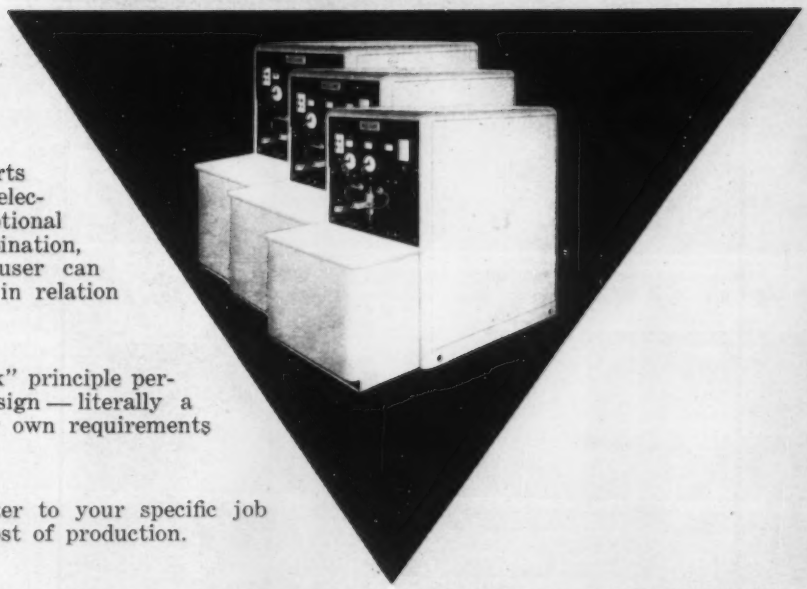
Lester A. Shea was made eastern division manager, **Lindberg Industrial Corp.** He is at Fair Lawn, N. J.

Steel Co. of Canada, Hamilton, Ont., appointed **L. H. Chater** chief engineer. **D. C. McCrady** succeeds Mr. Chater as chief engineer, Hamilton and Ontario Works. **J. G. Mitchell** replaces Mr. McCrady as superintendent, electrical department, at Hamilton, and **C. F. Dover** was named assistant superintendent.

Roger L. Stouffer was made product manager of welding supplies and equipment, **Enos & Sanderson Co.,** Buffalo.

Marshall Diaz was elected vice president and general manager, **Gallagher Iron Works,** San Diego, Calif.

George W. Morris was made superintendent of the wire department



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2. This "building block" principle permits flexibility of design — literally a custom design to your own requirements at minimum cost.

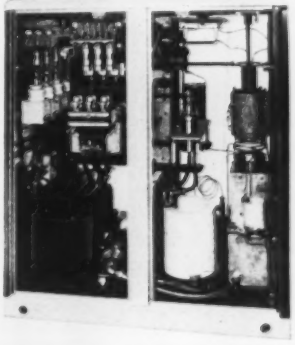
3. Matching the heater to your specific job reduces the per-unit cost of production.

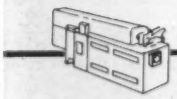
NEW IDEA IN ELECTRONIC INDUCTION HEATERS
Custom Design at Reasonable Cost....

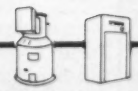
4. Call upon Magnethermic's application and design engineers for your best combination of "building blocks".

5. New Bulletin EH-57-6 contains full information on the standard electronic induction heater; the ten optional features; ratings; specifications on 15, 30 and 40 KW; a frequency selector chart; a surface hardening table; and other data.

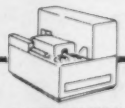
6. Bulletin EH-57-6 is available upon request. Heaters available from stock. Address your inquiry to Magnethermic, Youngstown, O.




DUAL FREQUENCY HEATERS


MOTOR GENERATORS

ELECTRONIC HEATERS


BILLET HEATERS
60 Cycle

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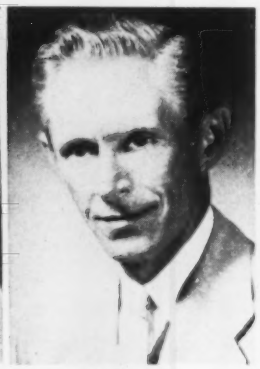
corporation
3990 SIMON RD. YOUNGSTOWN 7, OHIO

LYLE L. LENTH
Farquhar Div. plant mgr.

RAYMOND H. FILSINGER JR.
Vanadium vice president-sales



LELAND W. FOX
Huck Mfg. purchasing mgr.

E. D. COWLIN
Quality Fasteners v. p.-sales

FRED C. VALENTIN
Worcester Pressed Steel post

WILLIAM MOHR
CF&I Pacific Coast works mgr.

at the Los Angeles plant of **Bethlehem Pacific Coast Steel Corp.**

E. D. Cowlin was elected vice president-sales for **Quality Fasteners Inc.**, Kalamazoo, Mich. He retired from Eaton Mfg. Co. where he was general manager of the Reliance Div., Massillon, Ohio. In addition, Mr. Cowlin assumes a sales executive post with Moore & Steele, Owego, N. Y., manufacturer and distributor of railroad appliances.

Fred C. Valentin was appointed manufacturing engineer of **Worcester Pressed Steel Co.**, Worcester, Mass. He was chief tool engineer for the bearings division of Federal Mogul Corp.

Clausen Iron Co. Inc., Albany, N. Y., elected **Alfred B. Almstead Jr.** vice president - contracting; **Frederick G. Dennison**, vice president-construction.

Walter A. Evanko was made district manager of **Baker-Raulang Co.**, subsidiary of Otis Elevator Co. He is at Chicago.

William Mohr was made works manager, Pacific Coast Div., **Colorado Fuel & Iron Corp.**, with headquarters at the Oakland, Calif., plant. He was wire mill superintendent.

W. H. Dailey Jr. was appointed sales manager of the new pelletizing division of **Surface Combustion Corp.**, Toledo, Ohio. He was chief engineer, steel mill division.

Roger Lipscomb was named chief engineer at **Diamond Mfg. Corp.**, Alhambra, Calif.

S. Merle Hardison was made Philadelphia district manager for **Tube Turns**, Louisville. He succeeds **W. E. Geiser** who returns to headquarters staff.

A. C. Trautwein and **Charles H. Somers** were elected senior vice presidents of **Fyr-Fyter Co.**, Dayton, Ohio.

Norbert J. Connors joined the steel sales department of **A. M. Byers Co.**, Pittsburgh. He was president of Connors Steel Warehouse Inc.

Lyle L. Lenth was named plant manager of **A. B. Farquhar Div.**, Oliver Corp., York, Pa. He is succeeded as general superintendent of the division by **F. L. Wilson**, who has headed the methods department in the York plant and is replaced by **W. H. Geiselman.**

Raymond H. Filsinger Jr. was elected vice president-sales, **Vanadium Corp. of America**, New York. He was assistant vice president.

Leland W. Fox was appointed to a new position in charge of purchasing for **Huck Mfg. Co.**, Detroit.

L. M. Walker was made sales manager of **Westinghouse Electric Corp.'s** manufacturing and repair plant in Houston.

Peter M. Moanfeldt joined the staff of **Metals Research Laboratories**, Niagara Falls, N. Y., which serves Electro Metallurgical Co., division of Union Carbide Corp.

James S. Milliken, marine sales engineer for **Dravo Corp.**, transfers from the Houston office to Pittsburgh, in charge of the midwest sales territory.

Paul Byrne was made sales manager, western division, **Tracerlab Inc.**, at Richmond, Calif.

OBITUARIES...

J. Robert MacAllister, president, **Syracuse Heat Treating Corp.**, Syracuse, N. Y., died Aug. 23.

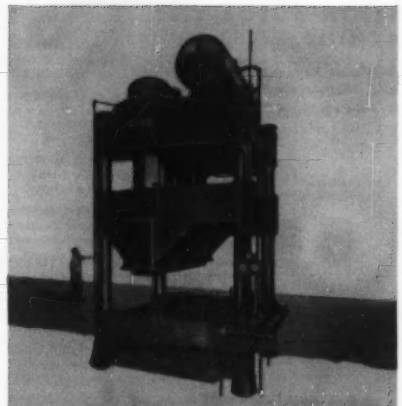
B. J. Pearson, 65, assistant to the general manager, **Strong Steel Foundry Co.**, Buffalo, died Aug. 27.

Dewey F. Kunde, 58, retired president, **Capitol Erecting Co.**, Milwaukee, died Aug. 20.

Raymond J. McAllister, 72, retired president, **D-J Engineering Corp.**, Chula Vista, Calif., died Aug. 21 in San Diego, Calif.

John Church, 75, manager of the Toronto, Ont., branch of **Darlington Bros.**, died Aug. 20.

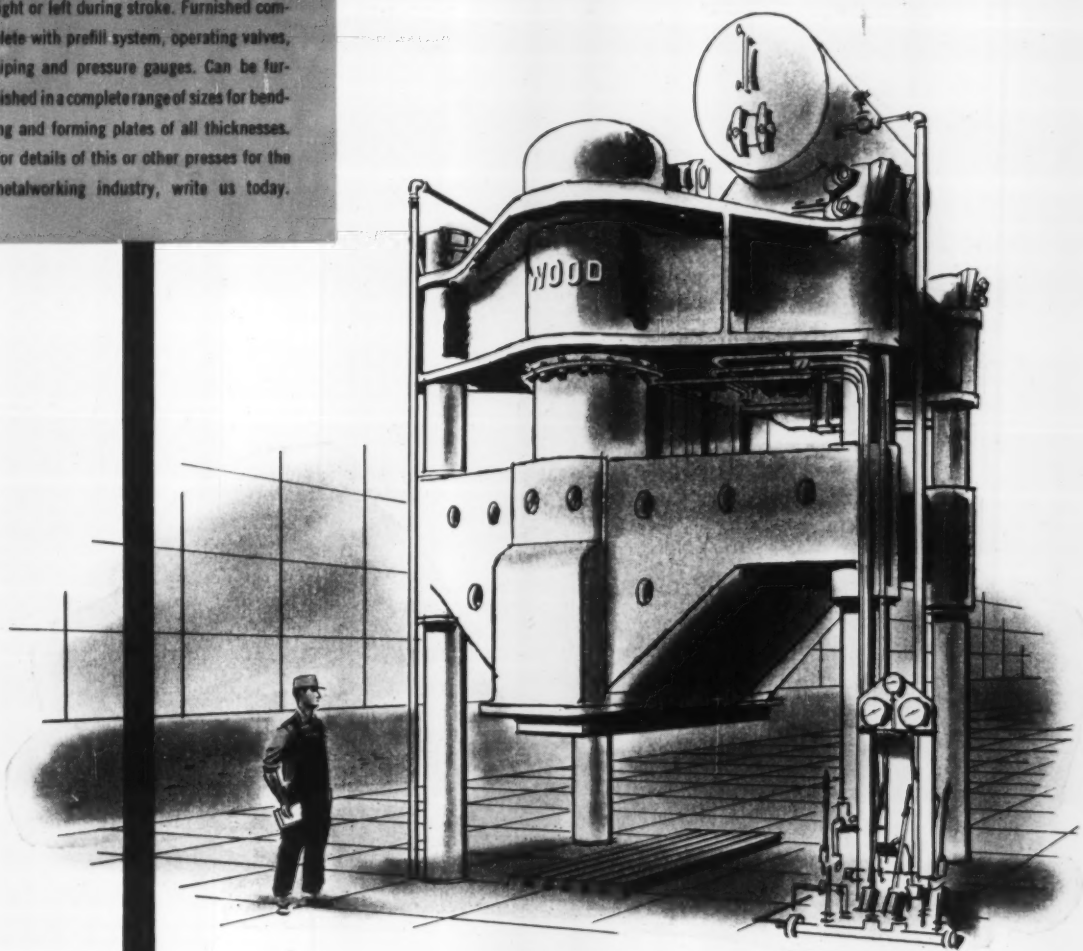
Herbert J. Rosen, 72, retired president, **Griffin Wheel Co.**, Chicago, died Aug. 22.



1500-ton Heavy-Duty Forming Press for bending and forming operations on heavy steel plate. Moving platen can be tilted right or left during stroke. Furnished complete with prefill system, operating valves, piping and pressure gauges. Can be furnished in a complete range of sizes for bending and forming plates of all thicknesses. For details of this or other presses for the metalworking industry, write us today.

You'll like what it does to production

It's just plain common sense—when your down-time decreases your production is bound to increase. Down-time can't be eliminated, but R. D. Wood Presses hold it to a minimum. The sound design, choice materials and careful craftsmanship that go into a Wood Press produce a superior product—a dependable, smooth-working press that can't help but increase production records. Write for our catalog and engineering information—no obligation.



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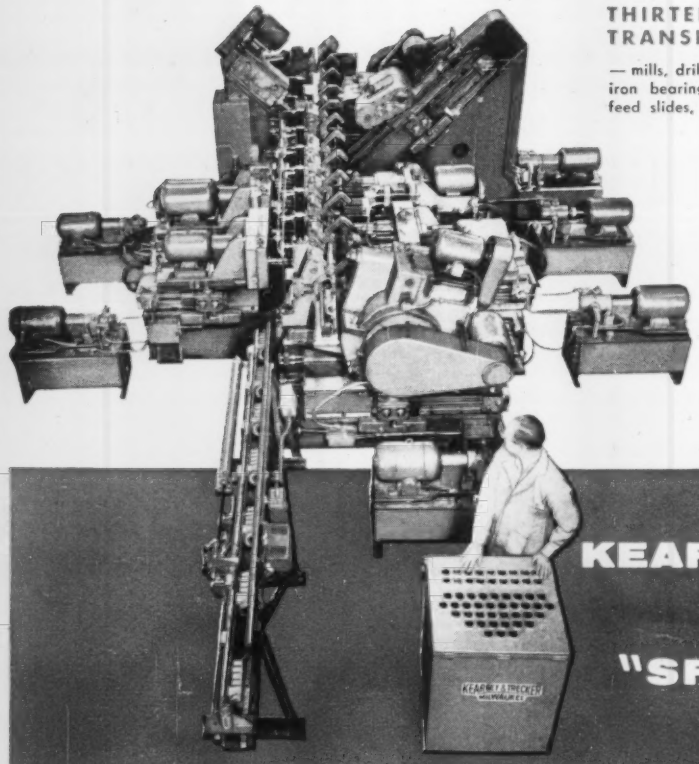
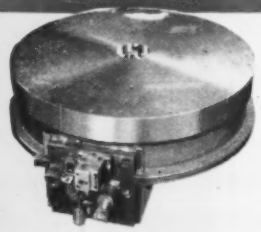


THIRTEEN STATION AUTOMATIC TRANSFER MACHINE

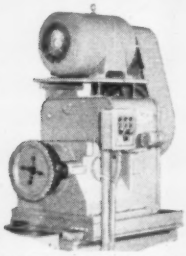
— mills, drills, reams, spotfaces, taps and saws apart cast iron bearing cap blocks. Machine includes 5 standard feed slides, 9 standard production units.

Because major components are standardized

KEARNEY & TRECKER TAKES THE "SPECIAL COSTS" OUT OF PRODUCTION MACHINE TOOLS



STANDARD ROTARY INDEX TABLE available in 4 different table diameters, any practical number of indexes.



STANDARD MILLING HEAD UNIT 4 sizes. Single spindle . . . various horsepower and speed ranges . . . single or double reduction drive . . . automatic quill retraction. Any size can be modified for boring.

Here's a sound, proven *economical* approach to your production machine tool problems . . . Kearney & Trecker production machine tools featuring standardized components.

You get IMPORTANT SAVINGS—benefit directly three ways: (1) lower initial cost; (2) less lead time needed and (3) proven standard units mean efficiency *plus* simplified machine maintenance.

Ask the Kearney & Trecker man—he'll show you more examples of standardized machine components in production machine tools — the keys to capturing more profits from production!

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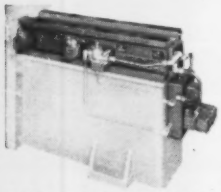
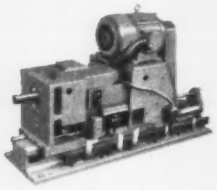


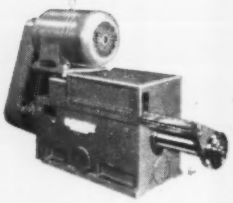
STANDARD FEED SLIDE UNIT provides hydraulic feed for milling, boring or drilling heads. Available in 4 sizes and in various length cylinder strokes.



STANDARD WAY TYPE DRILL UNIT for drilling, boring, reaming, counter-boring and chamfering. Single and multiple spindle arrangements, single or double feed rates.

ASK FOR FREE KEARNEY & TRECKER

Production Machine Tools Bulletin SMD-57. It provides full standard component details — and their application to production machine tools.



STANDARD QUILL FEED UNIT for drilling, boring, reaming, spotfacing, counter-boring and chamfering. Single or multiple spindle arrangements — single or double feed rates.

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J&L Opens Mill

Starts producing electricweld line pipe at Aliquippa, Pa. Operations are automated

PUSHBUTTON stations control all operations of J&L's $8-million electricweld pipe mill at its Aliquippa, Pa., Works.

Predetermined forging pressure is electronically measured. All units are speed synchronized. Current (2300 volts) is fed directly into the welding transformer, decreasing current impedance and increasing the speed of response and availability of power at the weld.

Fourth Product — Electricweld line pipe is J&L's fourth new product in the last 18 months. Others: Continuous galvanized sheets (made at Pittsburgh), stainless steel (Detroit), and cold-rolled strip (Youngstown).

Strip steel is shipped to the Aliquippa Works from Cleveland and Pittsburgh, but will be made at Aliquippa later this year when a new, 44-in., hot strip mill is completed.

Other facilities under construction at the Aliquippa Works include two basic oxygen steelmaking furnaces, additions to soaking pits, two continuous weld pipe mills, and an oxygen generating plant.

Builders — The pipe mill was built by McKay Machine Co., Youngstown, and installed by McDowell Co., Cleveland. Robert G. Riegel is the superintendent of the electricweld pipe mill.

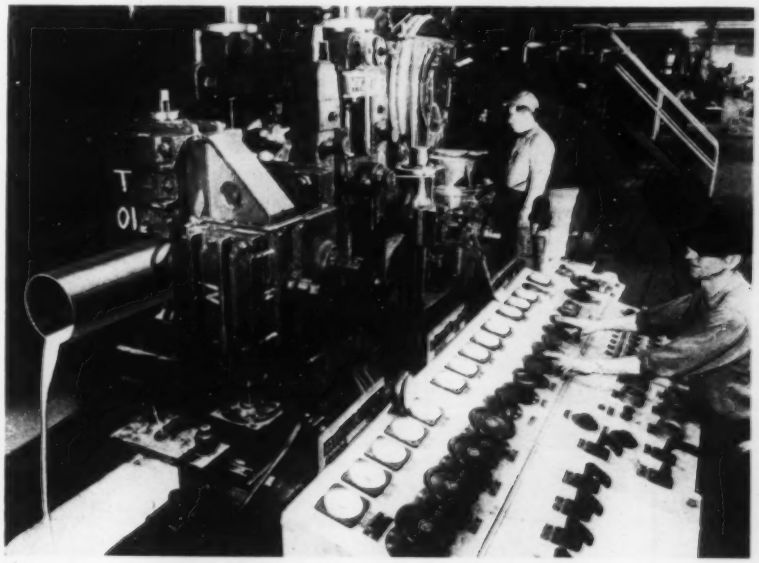
Distributor To Move

Benjamin Wolff & Co. will move into a new 65,000 sq-ft, steel and aluminum warehouse in Franklin Park, Ill., about Nov. 1. Wolff's present warehouse in Melrose Park, Ill., has been leased to Hotpoint Appliance Sales Co. Wolff's offices are temporarily quartered at Mannheim and Grant in Franklin Park.

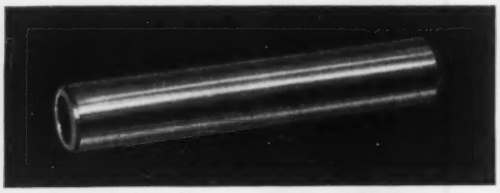
Cold Extrudes Molybdenum

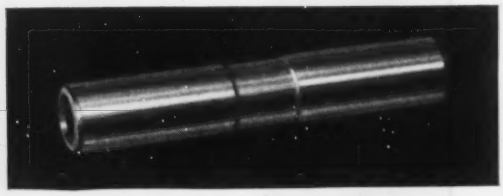
Bridgeport Brass Co., Bridgeport, Conn., is producing molybdenum seamless tubing by cold extrusion methods at its Hunter Douglas Div., Riverside, Calif. Normally, molybdenum is hot worked at 2000° F or higher, but many difficulties result from volatile oxide formation above 1300° F. Cold extrusion eliminates this problem and permits close tolerances after only

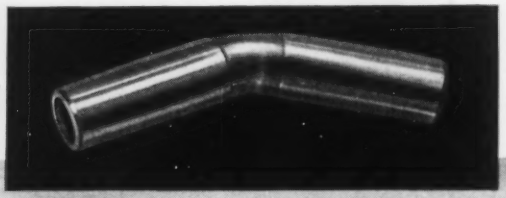
(*Please turn to Page* 94)



Pipe emerges from the pushbutton controlled electricweld pipe mill

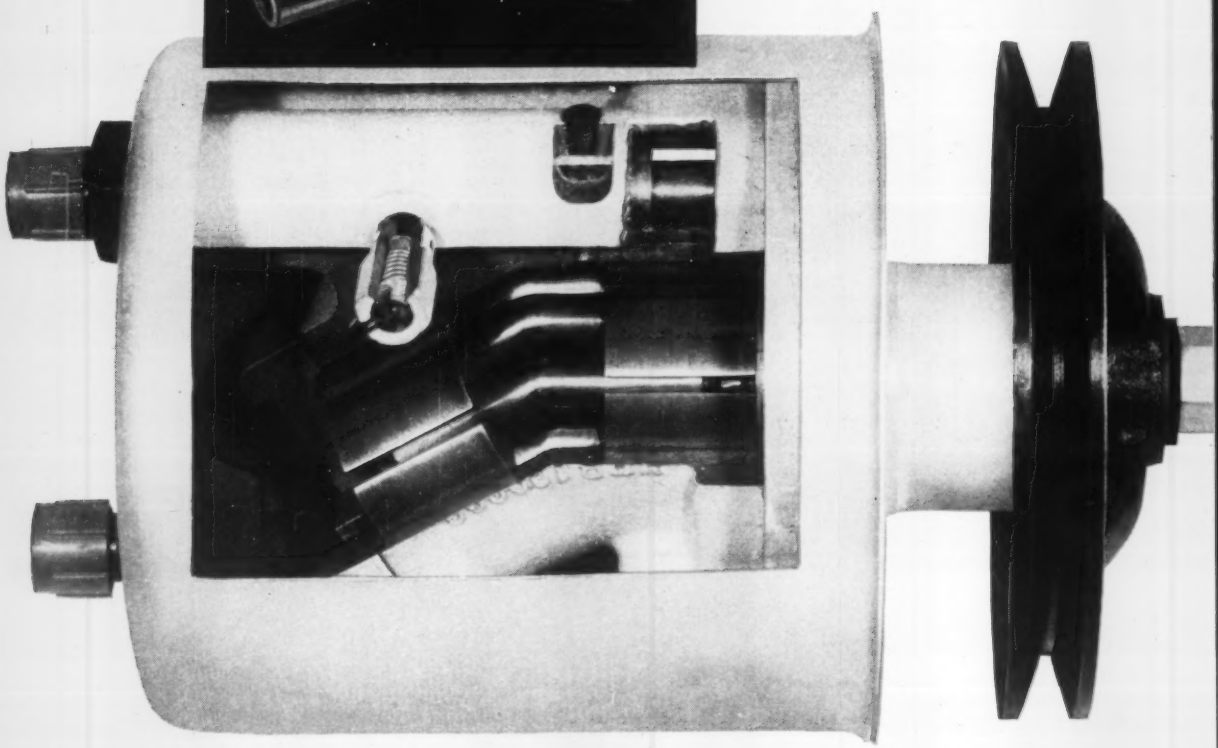






Republic

Unusual ductility and uniformity of Republic ELECTRUNITE Mechanical Tubing makes possible the assembly of this automotive hydraulic power pump, designed and assembled by Thompson Products, Inc. Finished O.D. is to ± .0003 inches.



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ELECTRUNITE Mechanical Tubing

meets all close tolerance requirements for new Thompson Products Automotive Pump!

Close tolerance, uniformity, ductility, workability — four important performance requirements, all reasons why Republic ELECTRUNITE Mechanical Tubing is used in a new automotive hydraulic power pump assembly.

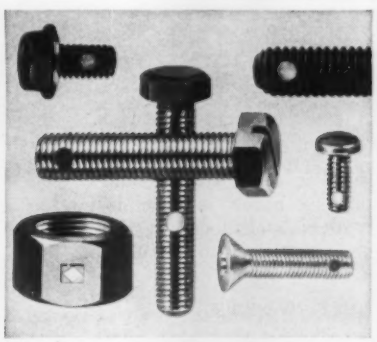
Designed and assembled by Thompson Products, Inc., Cleveland, Ohio, this pump furnishes power for power steering featured by a nationally famous automobile manufacturer.

Will-O-Hill Industries, Inc., Willoughby, Ohio, subcontractor, manufacturers, and specialists in close tolerance tubular stampings, cut $\frac{7}{16}$-inch-diameter Republic ELECTRUNITE Mechanical Tubing into units $2\frac{3}{16}$ inches long. Each unit is rolled to form a slight groove in the center, and bent to an angle of exactly 150°. Nine such pieces are used in each pump assembly.

Both ends are subsequently bent in a die, held to a tolerance of ± .0005 inches and finished with an O.D. to ± .0003 inches. This close tolerance represents outstanding workability, using manufactured tubing as base stock.

This is another example of how Republic engineers are able to work with you in solving precision problems and reducing costs through the unusual uniformity and ductility of Republic ELECTRUNITE Mechanical Tubing. For additional information, send coupon or write today!

UNIFORM ROUNDNESS AND SURFACE FINISH are reasons why Republic Manufacturers Wire is specified for the most difficult fabrication requirements. Up-to-date machinery and methods, skilled laboratory control, and careful inspection, assure every purchaser of a material that will suit his specific needs. Manufacturers producing a wide variety of items have found Republic Wire a valuable aid in minimizing losses, stepping up production, and increasing the salability of their products. Mail coupon for complete details.



MEET SEVERE REQUIREMENTS for maximum holding power with Republic Nylok Bolts and Nuts, specifically designed for bolted assemblies that must be vibration-proof and adjustable. Resilient nylon insert permanently embedded in the fastener provides re-usability, eliminates lost motion of assembling extra locking devices. Nylok Bolts and Nuts can be either hand or power wrenched. Republic offers manufacturers more than 20,000 standard and 8,000 special types and sizes of fasteners to meet practically any fabrication-assembly.

GREATER MACHINABILITY, better surface finish, higher strength, are a few of the over-all economies of using Republic Cold Finished Steel Bars for machine parts. This high-accuracy .22-caliber target pistol, made by the High Standard Manufacturing Corporation, Hamden, Connecticut, represents the ultimate in target pistol performance, winning honors in championship matches throughout the world. Republic Cold Finished Steel Bars, used for barrel stock in this pistol and other High Standard firearms, meet their most exacting specifications.

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- ☐ Republic Cold Finished Steel Bars
- ☐ Republic Nylok® Bolts and Nuts
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(*Concluded from Page* 91)

a few press operations, officials say.

Republic Buys Property

Republic Steel Corp., Cleveland, completed the purchase of the Massillon, Ohio, facilities of Enterprise Aluminum Co. The property, which is adjacent to Republic's steel plant, consists of 170,000 sq ft of building area. It will be used for storage of materials and steel products.

Completes Research Unit

Twin Disc Clutch Co., Racine, Wis., completed construction of a research laboratory for its Hydraulic Div., Rockford, Ill. The building has 12,800 sq ft of floor space with test equipment occupying 8580 sq ft and with the balance available for future requirements.

Meehanite Licenses Firms

Meehanite Metal Corp., New Rochelle, N. Y., appointed these firms as Meehanite foundries: Casting Service Corp., La Porte, Ind.; Byron Jackson Div. of Borg-Warner Corp., Lawrenceburg, Ind.; and Empire Foundry Co., Bonham, Tex., a subsidiary of Empire Pattern & Foundry Co., Tulsa, Okla.

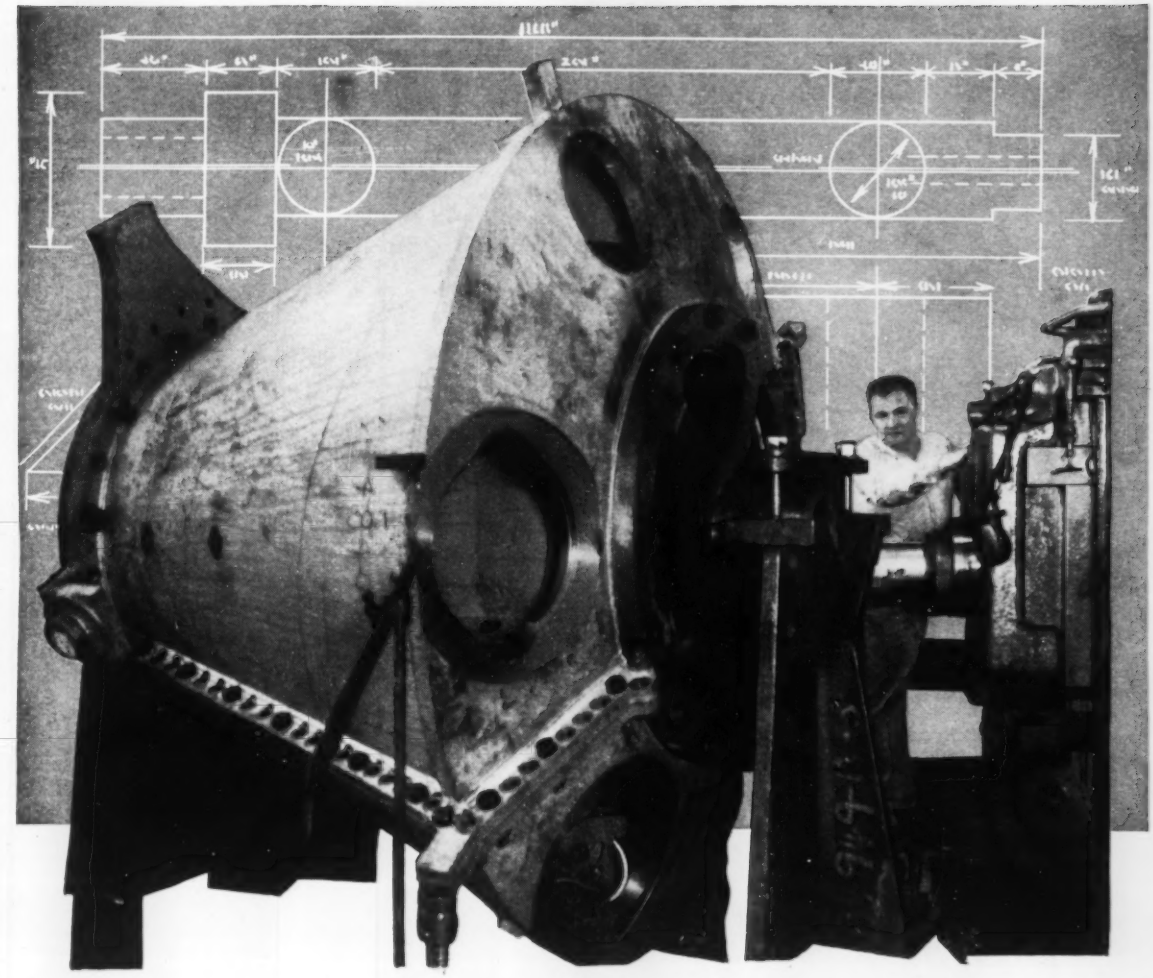
Eljer Enlarges Plant

A $150,000-addition to Eljer Co.'s Salem, Ohio, plant is under construction. The addition will be used to produce enameled cast iron plumbing fixtures and is part of an over-all $2.5-million expansion project.

Plans Research Facility

Allis-Chalmers Mfg. Co., Milwaukee, has broken ground for a $3,250,000 engineering and research laboratory at its Harvey (Ill.) Works.

It will provide a central engineering building, an engine and material handling product development laboratory, and an engine test wing. The building project



"TAILORING" STEEL

Many machines and pieces of special equipment must be fitted to their individual jobs in modern industry with the precision that a custom tailor devotes to making a suit for an individual customer. Maintaining the skill, experience and modern equipment that can accomplish such "tailoring of steel" to special needs has always been a matter of policy and pride at Sun Ship.

Machining special cylinders—as shown above—or drilling condenser tube sheets . . . boring a cylinder liner . . . making small parts . . . planning and building the special-purpose machinery that modern industry needs—such are typical jobs in the historic and versatile Wetherill plant, the machinery building unit of Sun Ship's integrated plant.

Since Sun Ship's foundation, in 1916, the spirit of keeping pace with progress in the various fields we serve has helped build our reputation for precision and reliability. On any problem of machinery production that you may face, you are invited to consult with our Sales Engineering Department.

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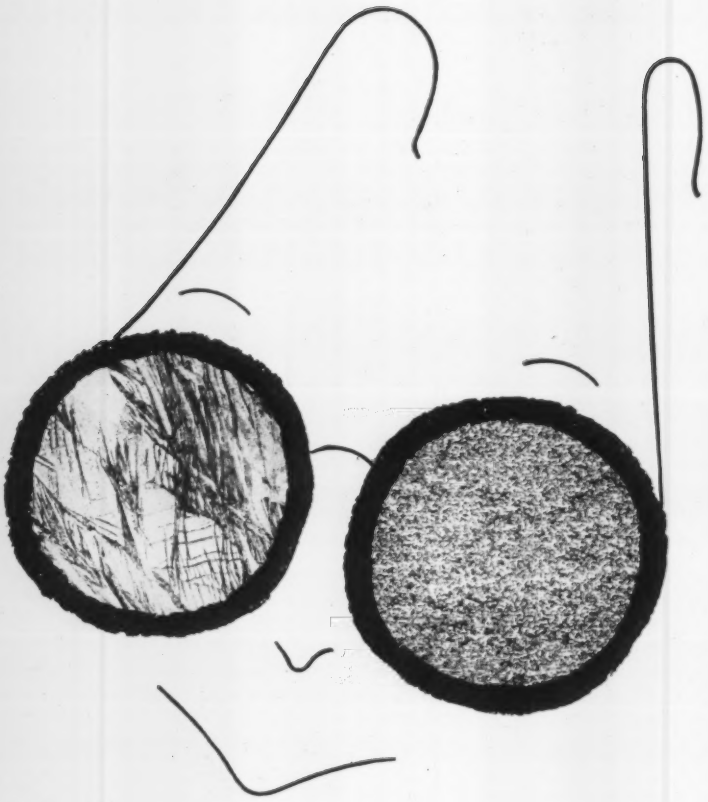


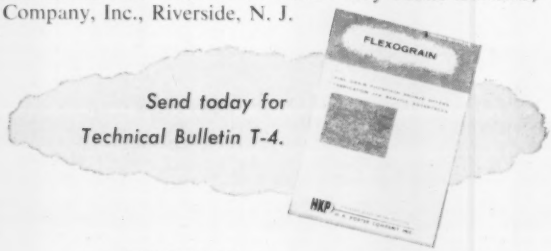
You can see the difference

. . . not with the naked eye, we'll admit . . . nor even with bifocals, but put a polished and etched sample of our new FLEXOGRAIN phosphor bronze under the revealing eye of the microscope and compare it with phosphor bronze strip generally available.

The scientifically controlled, fine grain structure of FLEXOGRAIN is great for severe bending and other complex forming operations . . . improves fatigue resistance, surface finish and ductility . . . and cuts costly fabrication rejects to a minimum.

At Riverside-Alloy we have always been keenly aware of the importance of grain size control in determining functional and fabrication properties of our alloys. We have been supplying fine grain phosphor bronze strip for special applications for over 20 years. Now, with our recently expanded, modern facilities, we can supply production quantities to meet your needs.

For detailed information write to Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.



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RIVERSIDE-ALLOY METAL DIVISION

also includes an experimental machine shop, a metallurgical laboratory, and a proving ground for material handling equipment.

U. S. Steel Buys Mill

Mesta Machine Co., Pittsburgh, has been awarded a contract covering the design and manufacture of a reversing slabbing-blooming mill (46 in., 2 high) and auxiliary equipment.

The installation will be made at the Duquesne (Pa.) Works of United States Steel Corp., Pittsburgh. It will replace rolling mill equipment in operation. The new mill will roll slabs and blooms from ingots weighing up to about 20 tons.

NEW ADDRESSES

Wilco Machine Tool Co. Inc. moved its offices and manufacturing equipment to its new plant on Route 6 in Bolton, Conn. Wilco Machine makes tools, parts, gages, jigs, fixtures, and special machines for industry, especially in the aircraft, automobile, glass, and metalworking fields. The firm also makes devices for atomic energy research.

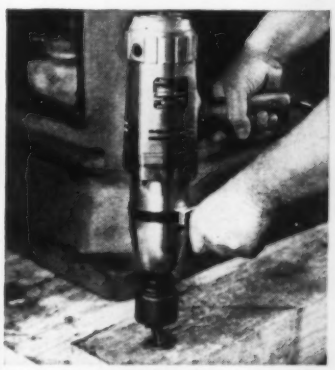
NEW OFFICES

Columbia Tool Steel Co., Chicago Heights, Ill., has formally opened its new sales and service office at 6955 E. Bandini Blvd., Los Angeles 22, Calif. Fred G. Porter, a member of the Chicago sales and service staff, is district manager. The warehouse will carry complete stocks of the company's tool and die steels.

Aluminum Div. of Olin Mathieson Chemical Corp., New York, plans to open seven new sales offices. It is part of a program to organize a nationwide sales setup prior to the beginning of large scale production of aluminum next year. Regional sales managers will be: John M. Welch, Chicago; Fred H. Edgar, Detroit; Forrest F. Tiffany, Cincinnati; A. F. Mey-

New B&D No. 300 Impact Wrench slashes maintenance down-time!

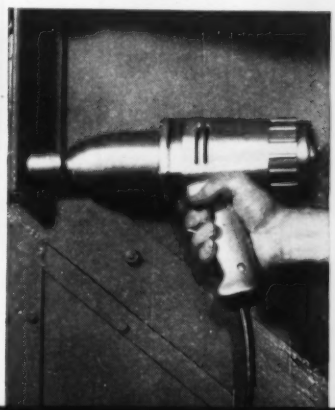
LONGER LIFE: torque tests show it has higher performance, cooler running, longer life than any other.



MORE POWER PER POUND: this light-weight (only 13.5 lbs.) tool really packs a powerful punch!

EASIER HANDLING: no nose or tail heaviness. No starting torque twist. All-position auxiliary handle.

NO. 100 IMPACT WRENCH: the rugged wrench for smaller applications; hits max. torque in 6 seconds!



Mail coupon today for free demonstration!

Now, Black & Decker takes the back-break out of moving equipment, installing new tools, making structural changes and many other like jobs! The new No. 300 Heavy-Duty Impact Wrench brings a minimum of 300 ft. lbs. of torque to bear—removes rust encrusted bolts as slick as a whistle—bangs home bolts as big as 1¼" effortlessly. The powerful No. 300 does the work—not the operator!

Look about you! Chances are you'll see many applications for this great, new, super-powered Impact Wrench—the tool that sets and removes bolts faster; saves you time and money. Then, mail the coupon for a free demonstration. A Black & Decker distributor will be happy to show you—in your own plant, on your own equipment—just how much the new B&D No. 300 Impact Wrench can slash *your* maintenance down-time! THE BLACK & DECKER MFG. CO., Dept. 2009, Towson 4, Md. (In Canada: P.O. Box 278, Brockville, Ont.)

Look Under TOOLS-ELECTRIC in Yellow Pages

Leading Distributors Everywhere Sell

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Quality Electric Tools—Power-Built for powerful performance

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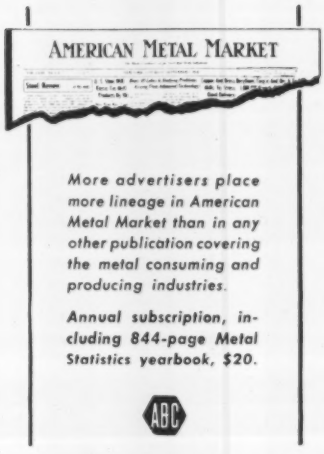

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American Metal Market

1882 · 1957 75 ANNIVERSARY

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THE DAILY NEWSPAPER OF THE STEEL AND METAL INDUSTRIES. ESTABLISHED 1882

ers, Philadelphia; W. P. Liljestrom, Dallas; James H. Wright, Houston; and R. B. Polonus, Memphis, Tenn. Primary aluminum will be produced by Ormet Corp., jointly owned by Olin Mathieson and Revere Copper & Brass Inc., New York. Olin will receive 120,000 tons a year; Revere, 60,000 tons.

REPRESENTATIVES

Kwik-Mix Co., Port Washington, Wis., appointed Indiana Products Co., South Bend, Ind., as a foundry sales representative for its power material handling unit.

CONSOLIDATIONS

McGraw-Edison Co., Elgin, Ill., maker of electrical and electronic equipment, is acquiring the **Allover Mfg. Co.**, Racine, Wis., manufacturer of home electric hair clippers, hair dryers, vibrators, and hand and foot massage machines.

Michigan Chemical Corp., St. Louis, Mich., is purchasing the **Petrochemicals Div.** of Swan-Finch Oil Corp., Chicago. Michigan Chemical is a producer of bromide and bromide compounds, brine chemicals and pharmaceutical intermediates, and rare earths.

Merger of **Liquid Carbonic Corp.**, Chicago, into **General Dynamics Corp.**, New York, has been approved by the firm's directors. If approved by shareowners of both concerns, Liquid Carbonic will be operated as a division under the direction of R. L. Nicholson who becomes a senior vice president of General Dynamics.

Fuller Co., Catasauqua, Pa., purchased **Dracco Corp.**, Cleveland, manufacturer of dust and fume collection equipment. Fuller, a subsidiary of General American Transportation Corp., Chicago, makes pneumatic handling equipment.

Harsco Corp., Harrisburg, Pa., manufacturer of seamless steel gas cylinders and nonferrous diecastings, acquired **Ainsworth Mfg.**

Save with SEMS

Four ways where Sems can cut assembly costs

1 The permanently attached washer eliminates time-wasting fumbling and extra hand operations.

2 Speeds assembly and increases worker productivity.

3 Prevents costly mistakes (washer cannot be forgotten or the wrong one used).

4 One unit to buy and inventory—screw and washer stock always in balance. Cuts ordering and billing time.

Here's the right combination for cutting costs on the assembly line.

Lamson & Sessions Sems eliminate extra time-wasting hand operations, assuring increased productivity. Sems take full advantage of power driver efficiency—there is no slow down while washers and screws are assembled.

Check the many advantages offered and you will decide it pays to standardize on Lamson & Sessions manufactured Sems.

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"We needed straight-line even heating without lag or overshoot...

so we ordered a

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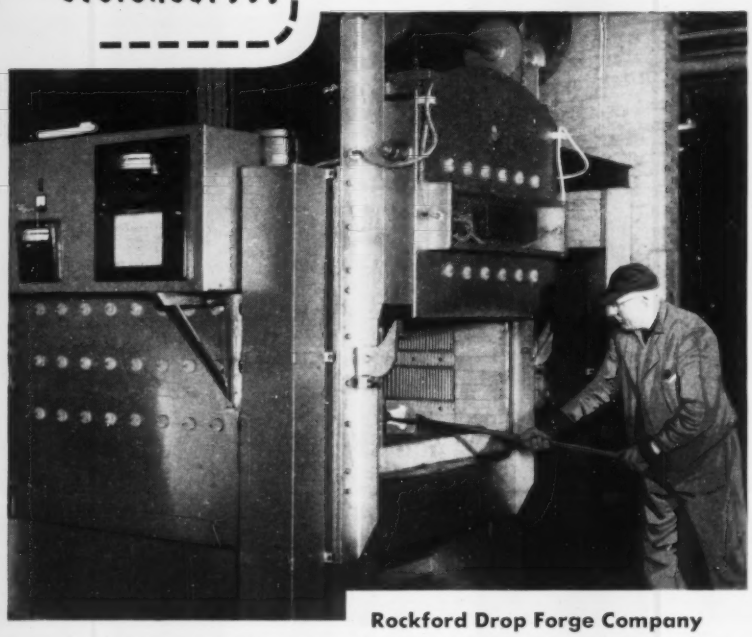

Rockford Drop Forge Company

Through-Hardens Upset Forging Dies To Maximum Hardness from 1850°F . . . with Improved Results!

"There is no doubt about the increased efficiency of our Hevi-Duty Furnace in this type of heat treating," says Carl R. Ree, Chief Metallurgist at Rockford Drop Forge. "The rapid heat up time . . . the equal, uniform heating . . . and negligible maintenance costs are features we like . . . plus the fact that this furnace is equipped with a saturable core reactor for stepless, proportioning control of power input!"

If you would like to increase the efficiency of many of your heat treating operations . . .

Write for Bulletin No. HD-441

HEVI-DUTY ELECTRIC COMPANY

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Heat Treating Furnaces . . . Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

Corp., Detroit, and **Standard Die Set Manufacturers Inc.**, Providence, R. I. Ainsworth makes door frames, metal stampings, and seat frames for the automotive industry. Standard Die Set makes die sets and drill bushings.

NEW PLANTS

Warren Corp., Pittsburgh, will open its Lustra Line Div. plant at Clarion, Pa., Sept. 15. The firm makes industrial laboratory equipment, hospital furniture, x-ray accessories, and photographic equipment. Richard J. McDermott, vice president, has been appointed resident manager in charge of the new facility.

Union Carbide Corp., New York, will build a plant at Fawley, England, for the manufacture of ethylene oxide derivatives. The plant's output will contribute to the expanding activities of Union Carbide Ltd., a British affiliate of the New York firm. The Union Carbide organization is constructing a polyethylene plant at Grangemouth, Scotland. It will have an annual capacity of 24 million lb and is scheduled for completion in October.

Construction of the building that will house **Timken Roller Bearing Co.'s** (Canton, Ohio) new bearing producing facilities at Ballarat, Victoria, Australia, is expected to get underway this month. Australian Timken Proprietary Ltd., the corporate name of the operation, will be the first company to produce tapered roller bearings in that country, officials say. It will have an annual capacity of 1 million bearings. Elmer Schweitzer, previously manager of Timken's plant in Zanesville, Ohio, is managing director of the new company.

Steel Improvement & Forge Co. is leasing (ten years) the former Lamson & Sessions factory which adjoins Steel Improvement's main plant at 970 E. 64th St., Cleveland, Ohio. The firm will occupy 180,000 sq ft of manufacturing space and will sublease the remaining 95,000 sq ft.

ALCO FORGES QUALITY IN STEEL

ALCO presses turn out open-die forgings to 30,000 lb; same ALCO steel, same high quality as ALCO circular forgings

Recently, at Latrobe, Pa., ALCO began production of open-die forgings for industry. They include rolls, pinions, shafts and others. Available to 40 ft in length and 30,000 lb in weight, they incorporate the same steel, are made with the same quality control, as ALCO circular forgings.

You save money with ALCO quality, leadership. Each forging is carefully controlled from open hearth to machining. If you do extensive machining on a forging, Hi-Qua-Led Steel®, which only ALCO offers, can cut your machining costs up to 50 per cent.

Buy the best forgings. ALCO now makes both circular and open-die types. For specific information contact your nearest ALCO sales office, or for a new full-color brochure write Spring & Forge Division, Dept. OCF-5, P. O. Box 1065, Schenectady 1, N. Y.

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4. Aircraft Fitting — Aluminum — 282 lbs. — 86 inches.
5. Aircraft Landing Gear — Aluminum 284 lbs. — 47 inches.
6. Missile Ring Splice — Aluminum — 54 lbs. — 20 inches.
7. Aircraft Spar Frame — Aluminum — 434 lbs. — 142 inches.
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Faster and faster, higher and higher — greater stresses, increased temperatures — all leading to continually increasing dependence on forgings — and in the forging field there is no substitute for Wyman-Gordon quality, experience and know-how.
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STEEL

September 9, 1957

Technical Outlook

HIGH TEMPERATURE ADHESIVE— Rubber & Asbestos Corp., Bloomfield, N. J., says it's ready with a new adhesive for bonding stainless steel which stands continuous service up to 500° F. The epoxide type material is used as a tape for metal-to-metal bonds. A liquid primer is used with tape for honeycomb sandwich construction.

ALUMINUM FOR REACTORS—A research reactor under construction at the Oak Ridge (Tenn.) National Laboratory will use what is said to be the largest aluminum pipe fittings ever forged. Made by Tube Turns Div., National Cylinder Gas Co., Chicago, the fittings are more than ½ in. thick and up to 3 ft in diameter. It's the first use of such materials for cooling a nuclear reactor.

SHAKE WELL—Under development at Stora Kopparbergs steelworks, Domnarvet, Sweden, is a method for stirring a large ladle by rotating it or shaking it on a horizontal table. Stirring will make ladle desulfurization with lime more efficient. The company plans to add the lime to the ladle at the same time as the pig iron.

OXYGEN SNIFFER— A new instrument called a Minoxo Indicator is said to be 20 times more sensitive than previous devices in measuring oxygen. It has two ranges: 0 to 10 and 0 to 100 parts per million. Applications: Atomic energy, metal treating, and the manufacture of electronic equipment, incandescent lamps, and bottled gases.

SWITCH TO EXTRUSION— Linde Co. says that rail sections for its automatic, oxyacetylene, flame-cutting machine cost 35 per cent less when it switched from castings to extruded SAE 1020. The supplier, Allegheny Ludlum Steel Corp., Pittsburgh, explains the change also saved 35 per cent in weight.

PAINT BEATS HEAT— A dibutyl titanate pigmented with zinc dust shows superior resistance to a short time blast from rocket exhausts, says the Department of Commerce. Olive-green silicon enamel failed the same test: Coated panels were passed through a blast flame at a speed of 1 in. per 10 seconds.

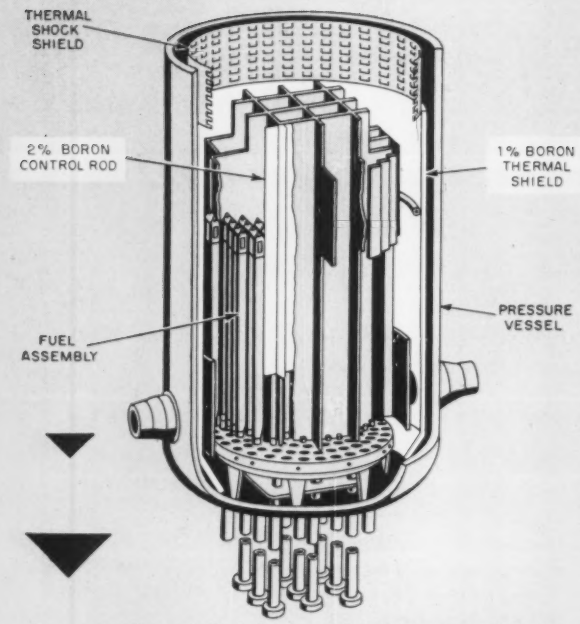
THIN STAINLESS— You can get ultrathin gages of stainless from Ulbrich Stainless Steels, Wallingford, Conn. Its new Sendzimir mill makes them down to 0.0006 in. thick.

BETTER SILICON— Impurities in metal silicon made by Westinghouse Electric Corp., Pittsburgh, are said to amount to less than 1 part in 6 billion. The development opens the door to improved transistors and rectifiers. Work by Siemens & Halske and Siemens-Schuckert, Germany, was supplemented by Westinghouse contributions to perfect the process.

DIG THAT FURNACE— Templeborough Melting Shop of Steel, Peech & Tozer, an English firm, dismantles the brickwork of open hearth furnaces with a Gradall, a Warner & Swasey (Cleveland) product. Dismantling can be started with a hook attachment within 6 hours of tapping. This is replaced by a bucket for removing the debris.

FASTER ANALYSIS— X-ray has speeded chemical analysis of foundry heats at Thompson Products Inc., Bell, Calif. Checks that required 6 to 8 hours are completed in 30 minutes. Quality is said to be much improved.

Metalworking Outlook—p. 57 *Market Outlook—p. 161*

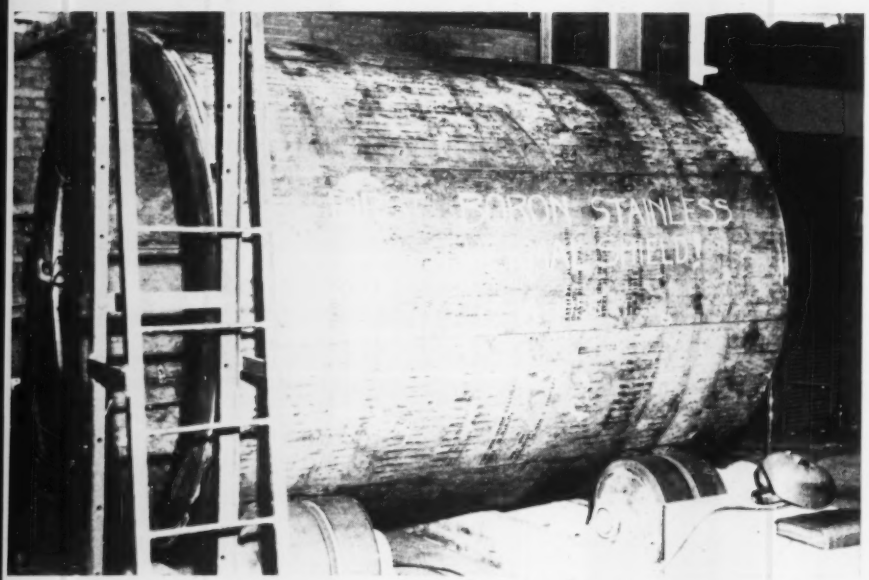


Boron stainless steels (white) used in Experimental Boiling Water Reactor (EBWR) at Argonne National Laboratory

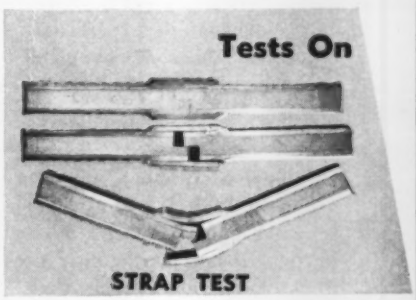
Boron additions of 1 to 2 per cent give the materials useful properties for moderating and shielding the flow of neutrons. Cladding may be used to extend applications

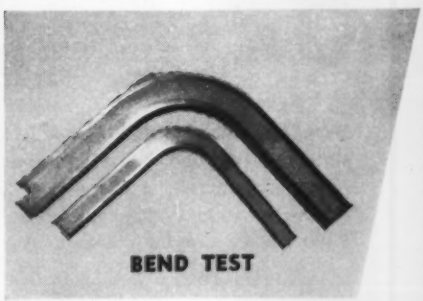
By DR. J. ALFRED BERGER
Professor, Head
Metallurgical Engineering Department
University of Pittsburgh
and
W. L. KEENE
Director, Research and Metallurgy
Superior Steel Corp., Carnegie, Pa.

A New Stainless for Atomic Energy



Thermal shield for EBWR is among first uses of new 1 per cent boron stainless





YOU'LL be hearing more and more about boron stainless steels as the nation's atomic industry picks up momentum.

Right now, type 304 stainless, containing 1 per cent boron, is being used as a thermal shield in atomic reactors; and 304 stainless, containing 2 per cent boron, is used for control rods (see left).

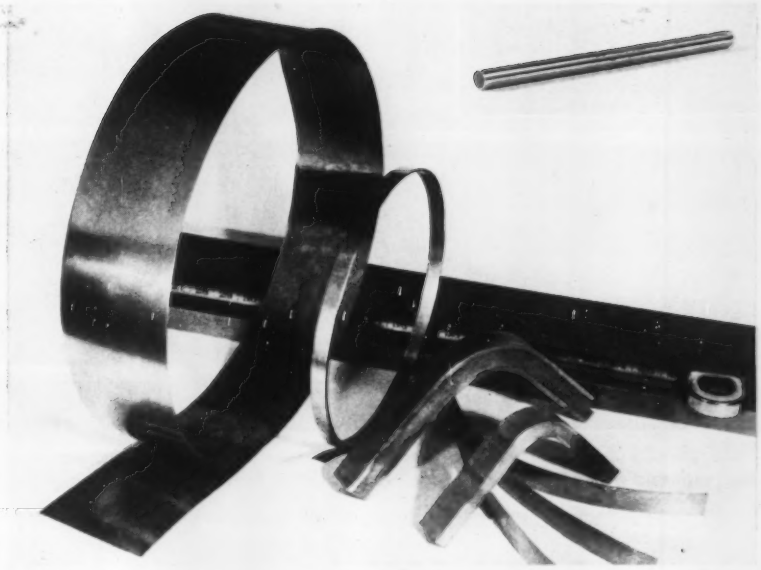
Applications in atomics are bound to grow because of the unique properties boron gives steel:

1. By virtue of its mass, the material absorbs gamma ray energy and converts it into heat which, for example, is absorbed by water on both sides of a thermal shield.

2. The neutron boron reaction does not produce hard secondary gamma rays.

3. Boron absorbs neutrons in the thermal range.

4. The use of boron stainless steel brings about a reduction in the weight and thickness of essential shielding and moderating components.



Standard boron stainless comes in plate, sheet, strip and clad forms. Inset shows a moderator rod made of 2 per cent boron grade clad with type 302

Savings—Argonne National Laboratory reports that the material cost of the 1 per cent boron stainless thermal shield in the Experimental Boiling Water Reactor (EBWR) was 55 to 75 per cent of an equivalent one of austenitic stainless. This does not take into account further savings possible in its installation, or in the dimensions, mass, and cost of the pressure vessel.

Problem — Steels with sizable amounts of boron are difficult to hot work. In iron-carbon alloys, boron additions in concentrations greater than 0.007 per cent produce a complex iron-boride, iron-carbide network around the austenite grain. Generally, this is referred to as the "boron constituent." In stainless alloys, some investigators have labeled it ($Fe_2B \cdot Fe_3C$) Cr_xNi_y, where x and y are variable amounts in the complex carbide-boride phase.

At hot working temperatures, the boron constituent appears to be more plastic than the austenite grain. When hot working pressure is applied, the grain boundaries part readily, giving an effect similar to the hot shortness of steels containing excess sulfur.

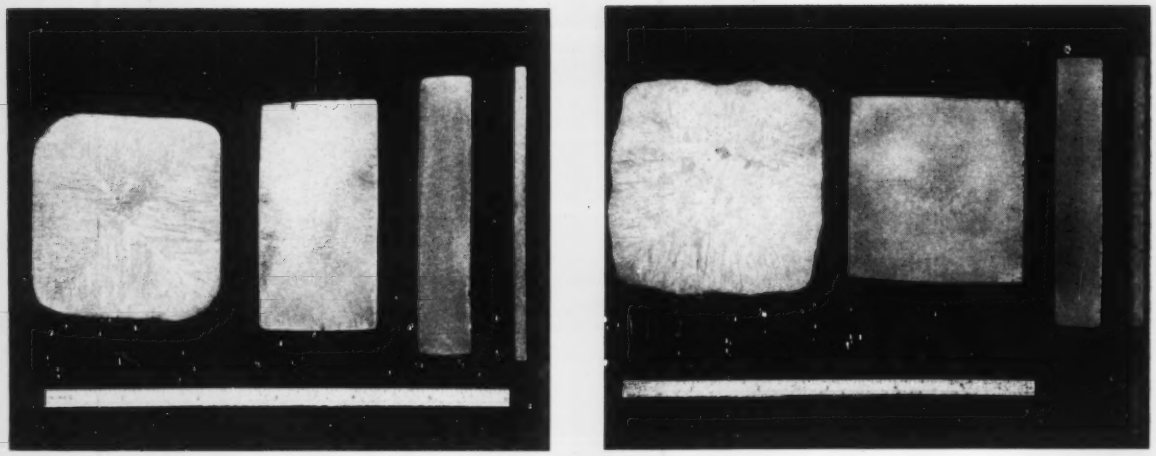
Solution—Experiments overcame these difficulties. For preliminary testing, a 175-lb induction melt of 18 Cr, 8 Ni was cast into three ingots. A 42 lb, boron free ingot was first cast, followed by two 60-lb ingots, each containing a 1 per cent boron addition from low carbon ferroboron. The 3½ in. square, 1 per cent boron ingots (weight about 60 lb) required six reheatings to hammer cog into slabs having a cross section of ¾ to 3½ in. The boron-free control ingot was easily cogged to a rectangular slab shape with two reheating cycles.

The success of the first tests led to the casting of a single ingot from a 300-lb heat, using the laboratory induction furnace. To hammer cog the 6 x 6 in. ingot (about 28 in. long without the hot top),

Clad Boron Stainless

STRAP WELDS AID CORROSION RESISTANCE IN STRONG ACIDS—Lower specimen shows welded assembly of 18-8 with 2 per cent boron clad with 302. The strap welded piece is type 347 stainless. Above it is a tensile specimen which failed at 25,500 psi with 19 per cent elongation. Top picture shows behavior in cold bend test. Radius was 2 in. with 5 tons pressure

BEND TESTS PROVE BOND IS GOOD—Lower specimen is 18-8 with 2 per cent boron clad on both sides with 15 per cent 304. It was cold bent through 2 in. radius. Top specimen contains 1 per cent boron bent through 1 in. radius. No cracks showed up in core or cladding in these tests



These photographs illustrate the macrostructures of comparative sections of stainless steel with and without boron addition. Numbers refer to specimens (left to right)

BORON FREE

1. Bottom section of ingot in the as-cast condition showing long columnar crystals extending into the central core of the ingot.
2. Intermediate hot forging section of the top half of the ingot showing how some of the columnar structure was broken down during hot working.
3. Final, fine-grained, hot forged slab size after hammer cogging.
4. Final hot-rolled strip size showing a fine grained structure with no ingot pattern.

BORON STAINLESS

1. The bottom section of the ingot in the as-cast condition shows columnar crystals extending part way toward the center and central zone of equiaxed grains.
2. The lower portion of the ingot hot top with some center segregation.
3. Final fine-grained, hot forged slab size after cogging.
4. Final hot-rolled, strip size of the boron stainless showing a fine grained structure with no ingot pattern.

it was necessary to obtain the services of Jessop Steel Co., Washington, Pa. Jessop's forging and rolling facilities and large size induction melting furnaces were needed to carry the research program to larger commercial scale.

This ingot was forged into a rectangular slab 1½ x 7½ in. It was later rolled on the Superior hot mill to a ¼ x 8 in. strip about 40 ft long. Lighter gages were made, using cold rolling with intermediate annealing. Some of this stock was cold rolled to 0.005-in. strip, which reportedly was the first 1 per cent boron stainless produced commercially as thin strip.

Table I—Typical Analyses of Boron Stainless Steels
Air Melted, Induction Heats

Heat Weight (*lb*)	*C*	*Mn*	*Si*	*Cr*	*Ni*	*B*
2400	0.08	0.78	0.51	17.95	11.01	1.03
3200	0.07	0.67	0.62	18.24	10.95	1.04
3200	0.08	0.84	0.80	18.02	10.91	1.07
3200	0.08	0.79	0.63	18.44	10.59	1.09

Scale Up—Production induction melts (3000 lb heats) came next since relatively large amounts of the 1 per cent material would be needed for shielding applications. The first large commercial heat was hot rolled from a slab ingot to a plate 1 x 32 in. about 130 in. long. It was cut into samples for testing corrosion resistance, weldability, formability, and nuclear properties. Some was hot rolled to ⅛-in. sheets, and a portion was cold reduced to light gages.

Critical Point — During forging and hot rolling, temperature must be controlled accurately. Boron stainless shows hot short characteristics if worked above about 2100° F. For example, during de-

velopment, a hot top heated to about 2150° F burst and crumbled when struck with a forging hammer.

The melting range is also lower than that of 18-8 without boron. Depending on composition, it's in the 2350 to 2450° F range.

Typical analyses of several heats of the 1 per cent material are shown in Table I. For most applications it is used in the annealed condition. Typical mechanical properties are in Table II.

Forming—Tests show that 1 per cent boron stainless is inherently notch sensitive due to its microstructure. Removal of stress raisers is recommended when cold forming. If design considerations require it, the material can be furnished in all the commonly recognized tempers obtainable by cold rolling. For example, "full hard" temper gives a tensile strength in excess of 180,000 psi, a yield strength of 170,000 psi, an elongation of 3½ per cent in 2 in. gage length, and a hardness of 40 to 45 Rc.

The steel is essentially a two-phase alloy composed of a complex boride phase in an austenitic chrome-nickel-iron matrix as shown by the microstructures, below.

Clad Product — Requirements arose making it desirable to have a boron stainless suitable for load bearing structures and having enhanced corrosion resistance, weldability, and resistance to shock. Photos on page 104 show two types of cores (1 and 2 per cent boron) with 15 per cent type 304 and 302 cladding on each side. The lower picture shows approximately 90 degree cold bends; no cracks are present in the core or cladding. An excellent metallurgical bond was obtained.

To obtain enhanced corrosion resistance in strong acids as determined by the Huey and Strauss tests, strap welds were made on ship lapped 2 per cent materials. The as-welded structure is shown in the center of the photo referred to above. Above it is a tensile specimen which failed at the strap weld. At top is a cold bend specimen which parted after a 45 degree bend.

Neutron Absorption — A 1 per cent boron austenitic stainless has a total theoretical thermal neutron absorption cross section some 15 times as great as an equivalent stainless steel without boron.

As mentioned before, the 1 and 2 per cent materials were made using low carbon ferroboron in which the boron occurs as "natural boron," having atomic weight of 10.82. The macroscopic absorption cross section calculations are based on "natural boron."

The isotope B^{10} has a much greater absorption cross section (4020 Barns). Highly enriched B^{10} is $3.30 per gram, so that a plate of stainless with a 1 per cent B^{10} would cost about 20 times as much as one containing the natural boron.

Table II—Mechanical Properties of 1 Per cent Boron Stainless

Plate, sheet, and strip—annealed condition. Thickness range 0.005 to 1 in.

Tensile strength	approx. 90,000 psi
0.2% yield strength	approx. 50,000 psi
Elongation in 2 in.	10-20%
Hardness	approx. Rockwell B 90
Cold bend—depends on thickness	under 0.375 in. thick, will bend 180° over 2T; plate heavier than 0.375 in. can be bent 90° with generous radii

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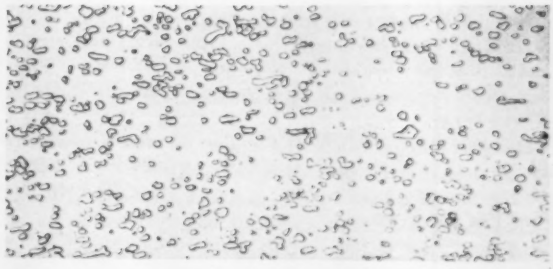
Microstructures of 1 per cent alloy

AS CAST—Shows (Fe_2B-Fe_3C) Cr_x Ni_y dendrites. White islands are the austenitic matrix. Etchant is 5 per cent picral, 1 per cent HCl in alcohol. 250X



WROUGHT—Hot working gives fine dispersion of complex iron boride, iron carbide constituent in austenitic matrix. Etchant same as for cast structure. 500X

HERE'S A CHART that'll help you make better use of barrel finishing. It helps because it radically reduces the number of variables you must deal with in selecting the right method for the job.

The Problem—Fourteen types of media and 18 compounds can be combined in several different process steps and mechanical setups. Theoretically, it is possible to have more than 5000 process variations for each metal.

To get answers to this complex problem, the research laboratory at Van Straaten Chemical Co., Chicago, has kept six barrels running a combination of two tests a day for three years. So far, 9000 comparisons have been made.

An Answer—A pattern that helps in the selection of the best combination of media, compound and method has been found. For any given problem, it reduces the number of experimental variations to about three or four.

The analysis of a tumbling operation involves mechanical and chemical considerations. Mechanical factors include the media, ratio of media to work, size and type of equipment, water level, and time.

Chemical factors include metal, amount of cleaning required, rustproofing, safety from attack, control of surface finish, and the action of the media.

Media Selection—Generally, soft metals require a light, smooth media, while harder metals call for heavier and coarser ones. For example, steel can be worked with hard, fast cutting abrasives without excessive down grading of the metal finish. But the same abrasives will produce an exceptionally rough finish on zinc and other soft metals and interfere with the steps that follow.

Heavy stock removal calls for rough, sharp media. Polishing requires smoother and less dense media.

The selection of the compound controls the microfinish, stock removal, color, and reflective luster obtained. The compound also has an important bearing on cycle time and costs.

Barrel Finishing Made Simpler

HERE ARE two case histories that show how the chart on the next page can help you.

By PHILIP KAFTOL
Product Manager
Van Straaten Chemical Co.
Chicago

No. 1—A maker of powder iron parts had trouble deburring gear teeth. Wire brushing did not leave the necessary smooth finish at the gear sides.

By checking against the chart, we see that the operation calls for the use of a fast cutting media, high concentrations of an abrasive compound and a low water level.

The manufacturer solved the problem by using an alkaline abrasive compound (16 ounces per gallon) and granite. The water level was kept low to increase cutting action and decrease tumbling time.

Parts were duburred in 1 hour, and the finish on the side was improved. Unit finishing costs were reduced 40 per cent.

No. 2 — A manufacturer was buffing zinc die-cast radio knobs that had minor surface imperfections. He wanted to switch to barrel finishing to reduce costs.

By looking at the chart we see that the process should be set up in two stages: 1. Remove imperfections and improve the microfinish. 2. Bring the parts to a high luster so they can be plated.

The media should be smooth, noncutting limestone. In the first stage of the process, a soft blending compound is required. After the barrel is rinsed, a lustering compound is used to obtain a high, bright finish.

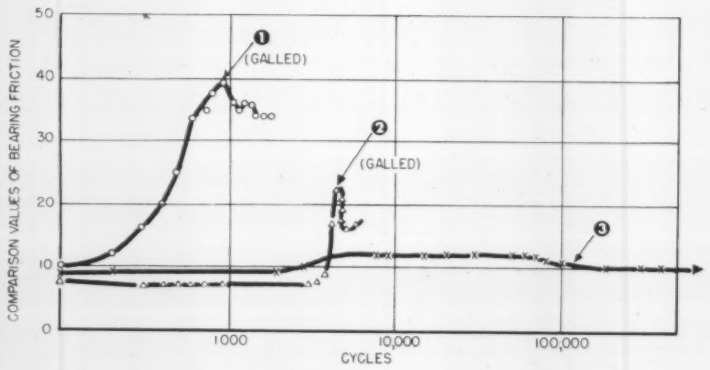
The process gave the manufacturer clean and lustrous parts. Costs were cut 60 per cent.

Barrel Finishing Chart

Operation	Tumbling Media	Compound	Concentration of Compound and Water Level
Steel, heavily soiled, to be cleaned and light burrs removed.	Fast cutting media, e.g., 100% fused aluminum oxide; ceramic bonded aluminum oxide, granite.	Tumbling cleaning compound with good rustproofing.	2 to 4 ounces per gallon of water. Level high and slightly above load.
Steel, heavily soiled, to be cleaned. Little or no deburring.	None. (self-tumbled)[1].	Tumbling cleaning compound with good rustproofing.	2 to 4 ounces per gallon of water. Level high and slightly above load.
Steel, oxide scale to be removed.	Fast cutting media. 100% fused aluminum oxide; ceramic bonded aluminum oxide, granite.	Acid descaling compound inhibited against pitting[2] or fast cutting alkaline abrasive compound.	2 ounces per gallon of water. High level. 8 to 16 ounces per gallon of water. Low level.[3]
Steel, acid descaled; to be neutralized and cleaned.	After draining and flushing barrel, use same media as in descaling.	Highly alkaline cleaning compound for neutralizing with rustproofing.	2 ounces per gallon of water at high level.
Steel, bad surface defects or heavy burrs to be removed.	Hard cutting media. 100% fused aluminum oxide or other cutting stones.	Fast cutting alkaline abrasive compound.	8 to 16 ounces per gallon of water. Low water level.[3]
Steel, light deburral; remove surface scratches; microfinish to be improved.	Noncutting media. Smooth aluminum oxide or granite, limestone, zinc or soft steel shapes.	Soft polishing or blending alkaline compound.[4]	2 to 16 ounces per gallon of water, depending on amount of surface grinding necessary. Water level varies.[5]
Steel, to be lustered or burnished. Surface defects removed; has microfinish below 3.	Smooth media. Hard steel or zinc shapes, limestone, smooth ceramic bonded aluminum oxide.	Alkaline lustering or burnishing compound.	2 to 6 ounces per gallon of water. Water level 2 in. above load.
Soiled aluminum to be cleaned and light burrs removed.	No media or light, smooth media such as limestone, ceramic shapes or granite.	Alkaline cleaning compound inhibited for safety on aluminum.[6]	2 ounces per gallon of water with level 2 in. above load.
Aluminum, remove deep surface imperfections.	Light, sharp cutting. Granite.	Mild abrasive inhibited for safety on aluminum.[6]	8 to 16 ounces per gallon of water at low level.
Aluminum, remove light surface imperfections, improve microfinish.	Light, smooth media. Limestone, ceramic shapes.	Blending compound inhibited for safety on aluminum.[6]	2 to 16 ounces per gallon. Water level varies.[5]
Aluminum, lustering or burnishing parts with low microfinish.	Limestone.	Alkaline lustering compound inhibited from attacking aluminum.[6]	2 to 6 ounces per gallon of water at 2 in. above load.
Brass or bronze, to be cleaned and light burrs removed.	Self-tumbling without media[1] or light cutting. granite or limestone.	Alkaline cleaner inhibited from darkening brass, bronze.[7]	2 to 4 ounces per gallon. Water level even with or above load.
Brass or bronze, remove deep surface defects.	Good cutting media. Aluminum oxide, granite.	Alkaline abrasive compound inhibited from attacking brass, bronze.[8]	8 to 16 ounces per gallon of water at low level.[3]
Brass or bronze, remove lighter surface imperfections, improve finish.	Light cutting or smooth media. Granite, limestone.	Alkaline blending compound[9] inhibited from attacking brass, bronze.	2 to 16 ounces per gallon of water at low level.[3]
Brass, or bronze, luster parts with low microfinish.	Smooth media. Hard steel shapes, ceramic shapes, ceramic bonded aluminum oxide, limestone.	Alkaline lustering compound inhibited from darkening brass, bronze.	2 to 16 ounces per gallon of water at 2 in. above load.
Zinc alloys, clean light soils and remove surface imperfections.	Smooth media. Limestone, ceramic shapes.	Alkaline blending compound inhibited from darkening zinc.[10]	2 to 16 ounces per gallon of water. Water level varies.[5]
Zinc and its alloys. Luster and clean parts with low microfinish.	Smooth limestone.	Alkaline lustering compound inhibited from darkening zinc.	2 to 6 ounces per gallon of water. Level 2 in. above load.

(1) More economical because of absence of media. Deburring, if any, is slow.
(2) Use acid where part has scale in recesses that cannot be reached by abrasive and media.
(3) One-quarter to one-third of total amount of water required to cover load.
(4) If run a long time, will break down and produce an almost burnished surface.
(5) Use low water levels and heavy concentration when cutting is desired; high water levels and low concentrations when less grinding is required.
(6) Must also produce white color on aluminum.
(7) Proper compound will actually help brighten.
(8) Will give a light matte finish.
(9) With smooth media will produce an rms as low as 2.
(10) Microfinish to be brought to 2 rms.

Bearing Life Comparison



NOTE: Fabroid bearing test was stopped after 1 million cycles. Bearing was still in good condition.

	1	2	3
Inner race	4340 steel chrome plated	4340 steel chrome plated	440 stainless
Outer race	Aluminum bronze	Aluminum bronze	Fabroid
Lubrication	Grease	Grease	None
Radial load	2,000 lb	1,000 lb	6,000 lb
Unit load on bearing face	8,500 psi	4,250 psi	14,100 psi

Airframemakers compared standard and Teflon lined, self aligned bearings. This chart indicates typical results from tests

Liners Lubricate Bearings

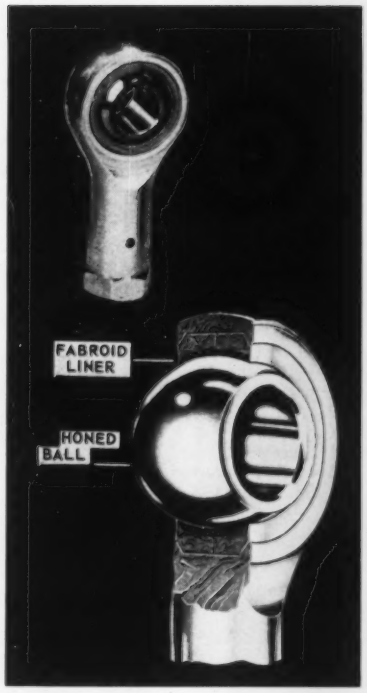
Woven from Teflon and glass fibers, they support static loads up to 60,000 psi. Applications: Self-aligning and flat thrust bearings, guide rails, lined nuts

THE MILITARY services face the chore of rewriting specifications for self-aligning bearings because of test results like those in the chart above.

The bearing that has surpassed present specifications is perpetually lubricated by Teflon. One of its most promising applications will be in rod ends like those widely used in airframes.

Lube Layer—Separating the ball from the outer ring is a liner of Teflon fibers. This liner, called Fabroid by its maker, Micromatic Hone Corp., Detroit, is a weave of Teflon backed up with a weave of glass fibers impregnated with thermosetting plastic.

The two layers are bonded and cured under pressure at about 350° F. The glass backing supports the Teflon and keeps it from distorting under high temperatures and pressures. Fabroid bearings have supported static loads of up to 60,000 psi.



Cutaway drawing shows how the Fabroid bearing assembly is made on rod ends

Precision Assembly—The ball is honed to about 3 microinches surface finish. Geometry also is closely held. The Fabroid liner is preformed, then bonded to the retainer with a hot adhesive. Retainers are assembled around the ball and pressed into the outer ring.

Final curing of the liner is done with the ball in place. This assures absolute conformity of the liner to the surface of the ball.

At Work—Under load, the Teflon face of the liner coats the ball; relative movement in service is between two layers of Teflon. Tests show that in no case does the coefficient of friction exceed 0.04 throughout the operating temperature range of —65 to 400°F. Elasticity of the Fabroid liner adds to its ability to operate in contaminated, dusty, or abrasive atmospheres.

Other Uses—Look also for these Fabroid applications: Flat thrust bearings, sliding seals, flat and profiled guide rails, and lined nuts for screw-type actuators.

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More Jobs Open For Rare Earth Additives

1. DUCTILITY IMPROVEMENT: Decrease hot shortness in some grades of stainless steel and high alloys. Make rolling easier and cut scrap loss.

2. STRENGTH IMPROVEMENT: Increase tensile and stress-rupture strength of low alloy cast steels. Vastly improve impact properties. May do the same for wrought low alloy steels, particularly at low temperatures.

3. TRAMP ELEMENT CONTROL: Prevent segregation and other detrimental effects of tramp elements such as lead, silver, and tin.

4. GRAIN REFINEMENT: Control primary grain structure in large ingots, probably by providing nucleation centers, increasing yield.

5. DEOXIDATION: Oxygen-grabbing properties valuable in high melting alloys where low vapor pressure deoxidants might boil off.

6. SCALE SUPPRESSION: Prevent or reduce scale formation up to about 1900° F (with opposite effect above that temperature).

Greater production and more knowledge of what they can do spells out more work for them. They enhance rollability and strength of low alloy and carbon steels

A PRODUCER of stainless steels was having trouble with billets of 309 and 310. They showed coarse columnar structure with frequent cracks. The company tried rare earths as a remedy.

Five pounds of mischmetal per ton of steel were added to the ladle. Ingot ductility improved, rolling pressures decreased, and scrap losses dropped. The company figures the mischmetal saved $80 per ton of steel.

What Is it?—Commercial mischmetal is a mixture of rare earth elements in metallic form, derived from monazite sands. Its composition varies, but a typical analysis runs about 50 per cent cerium, 25 per cent lanthanum, 17 per cent neodymium, and the balance other rare earths and iron.

Rare earths are also sold as mixtures of chlorides, hydrates, fluorides, and oxides. Their active constituents vary (as oxides) from 45 to 95 per cent. The total metallic equivalent seems to be considered more important than the percentage of any one element. Residual cerium and lanthanum have been identified as active agents in the compounds; significance of the other components is less clear.

What They Do—A number of valuable effects have been attributed to these materials, but those of present importance boil down to:

1. Prevention of hot shortness in high-alloy austenitic stainless steels.
2. Control of tramp elements such as tin, lead, and arsenic.
3. Promotion of nodule formation in the manufacture of ductile (nodular) iron.
4. Improvement of impact resistance in cast steel and low alloy wrought products.

There are a number of other areas in which rare earths may be valuable—evidence so far isn't conclusive. Some of these are:

1. Control of oxygen, hydrogen, and sulphur in solidifying metal.
2. Scale suppression in forging.
3. Refinement of ingot grain structure.

User—For several years, Carpenter Steel Co., Reading, Pa., has been using ladle additions of mischmetal to make its Carpenter 20 hot workable. This high-copper, austenitic stainless (0.07 C, 20 Cr, 29 Ni, 2 Mo, 3 C) was developed especially for resistance to sulphuric acid. The high copper content improves its resistance to corrosion, but makes it hot short.

Before Carpenter developed its rare earth technique, applications for Carpenter 20 were limited to cast products. The company now produces the alloy in strip, wire, bars, plates, forging billets, and tubing.

Ductility—"Improvements in ductility (achieved through rare earth additions) take two forms," says W. E. Knapp of American Metallurgical Products Co., Pittsburgh. "With a given mill pressure, steel will stretch farther. At any degree of stretch, there will be less tendency to crack."

Does the improvement in ductility that rare earth additions impart to hot short steels like 309 and 310, and some of the high carbon steels, carry over to the low

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carbon steels? Norman F. Tisdale, manager of sales, Molybdenum Corp. of America, Pittsburgh, (another producer of rare earth compounds) says: "As an aid in rollability, rare earths are outstanding with low carbon steels. Those steels don't have the hot strength of higher carbon steels. They tend to tear during blooming mill operations."

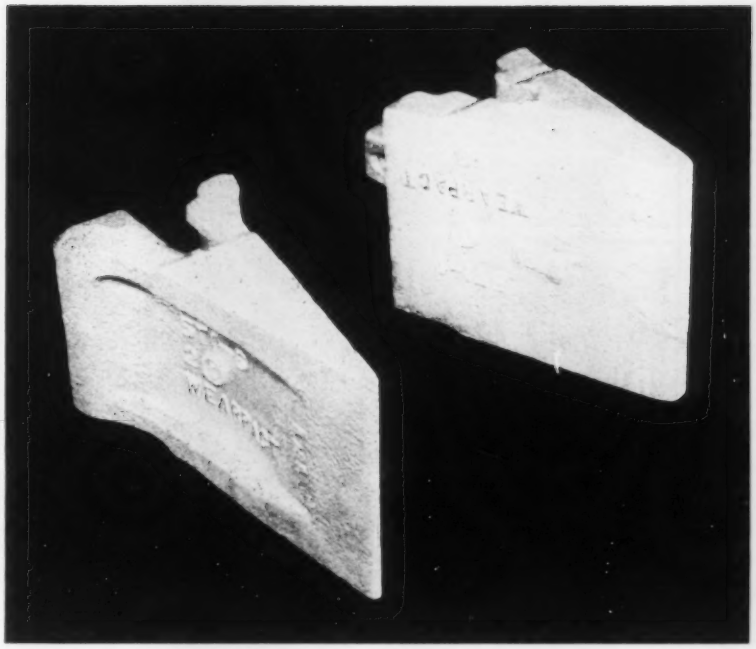
But there are doubts about how much additional ductility rare earths can impart to easy-to-roll carbon steel. One big steel company found much improvement in one mill test, none in another. Why? It's one more mystery of these relatively unknown materials.

Facts Needed—Rare earth producers are frank to admit that their industry has been held back by lack of knowledge. One complains that they are even hampered by the name—"They aren't rare and they aren't earth!"

Much has been made of the chemical and physical similarity of rare earth metals, and of the difficulty of separating them. But they have differences, such as melting point and vapor pressure, which may be of metallurgical significance. Mr. Knapp thinks that producers should develop a system of alloys in rare earths so that customers can get special properties by specifying a particular grade.

Cost—The price has been going down. A pound of oxide mixture that cost about $3 in 1951 sells for $1.25 a pound today, reports Davidson Chemical Co., Baltimore. Metallurgical Enterprises, Buffalo, markets a rare earth fluoride mixture of roughly 70 per cent metallic equivalent that contains the same proportion of elements as mischmetal. It sells for $1.10 a pound, compared with $3.50 a pound for mischmetal. Such prices bring rare earths into the ball park with other alloying additions, and as use grows, they can be brought down farther.

Nodular Iron—Mischmetal producers such as Mallinckrodt Chemical Works, St. Louis, have an established market in the foundry industry which uses the material to make nodular (ductile) iron. The additive causes the graphite flakes to coalesce into small spheres, and counteracts the tendency of trace elements such as lead, titanium, copper, and arsenic, to disperse the graphite. Mischmetal is often combined with other materials to produce a more economical additive.



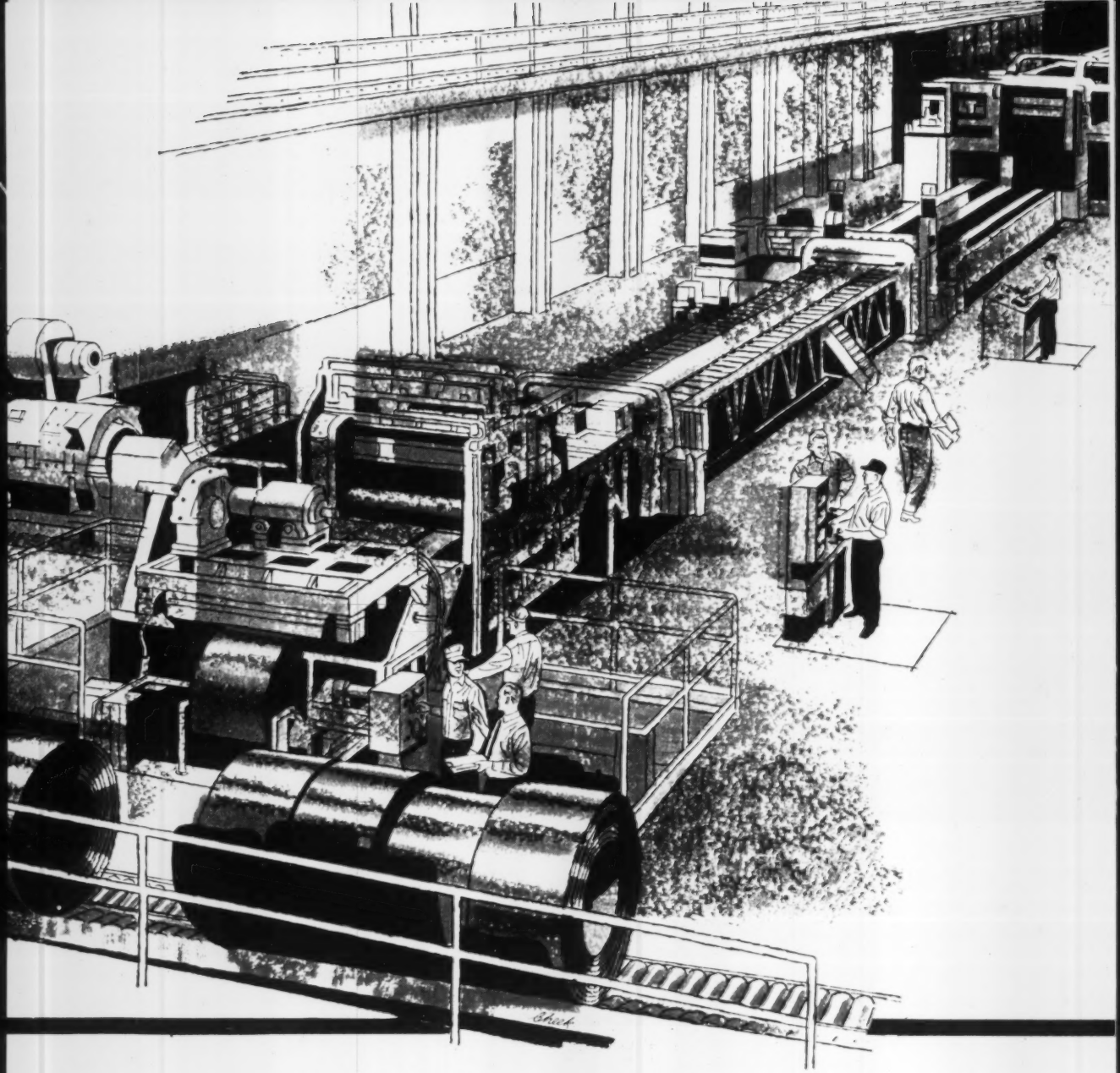
Dipper teeth for a heavy duty mining shovel cast of Wearpact, a low alloy steel with impact properties enhanced by the addition of rare earths

The steel foundry industry is using rare earth additions to develop better impact properties for cast steel. Wearpact, a new cast steel product of American Steel Foundries, East Chicago, Ind., is such a development. Although classed as a low alloy steel (0.23-0.33 C, 1.30-1.80 Mn, 0.30-0.60 Si, 0.40-1.00 Cr, 0.40-0.60 Mo, 0.50 Ni max), test bars (500 Bhn) shows 245,000 psi tensile and 190,000 psi yield strength. Installed in a gyratory rock crusher, bottom plates of Wearpact handled 400,000 tons of abrasive taconite before needing replacement. Although worn to a feather edge, the castings showed no sign of cracking or breaking.

Ahead—As more knowledge of the action of rare earths is acquired, they will probably become of greater importance in ferrous metallurgy. Work by Metallurgical Enterprises indicates that rare earth benefits are due to their action on nonmetallics. The action causes an undercooling or late freezing effect, resulting in finer grain size and decreased segregation. But the use of rare earths to promote clean steels and control ingot grain size still has a long way to go. Carpenter Steel Co., for instance, finds the grain nucleation effects most pronounced in large ingots.

Rare earth compounds (mischmetal especially) have a strong affinity for oxygen, but their use as deoxidizers has been limited. Their role in this respect may increase, especially when combined with other functions, if costs drop appreciably.

Big producers like Lindsay Chemical Co., West Chicago, Ill., using ion exchange methods of separation, are advertising rare earths by the carload and have scarcely scratched the steelmaking surface. New entries in the field (Heavy Minerals Co. of Vitro Corp. of America has just begun production) will increase the supply and help to bring the price down.



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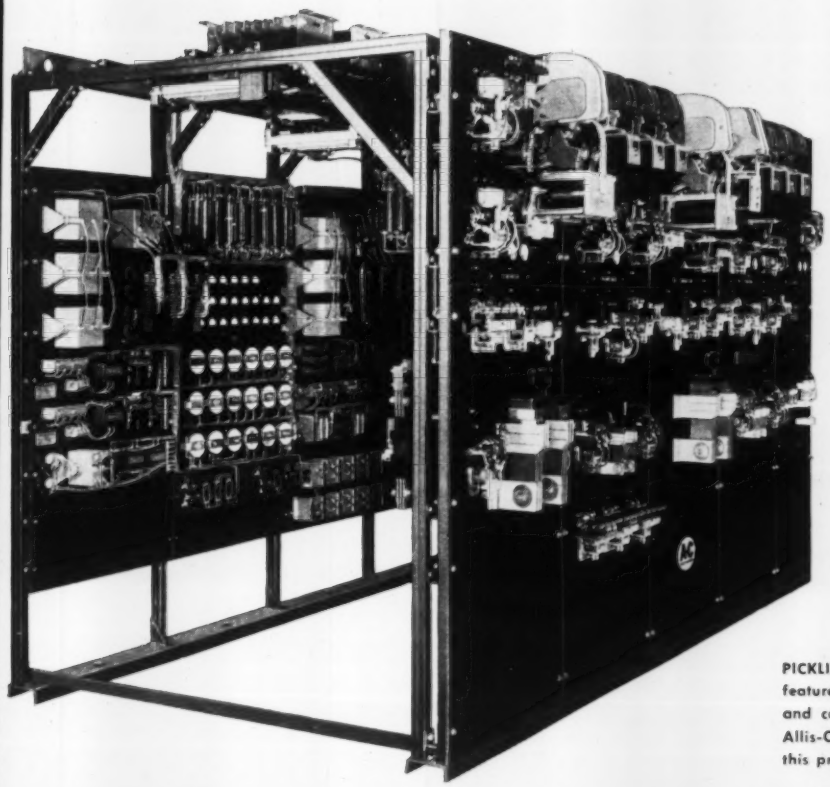
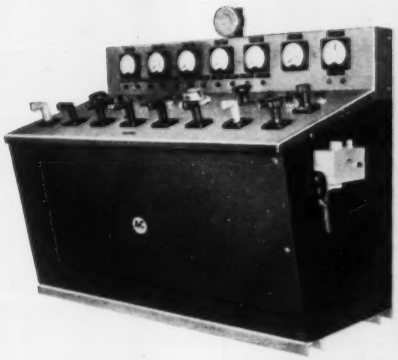
Get ultimate precision control for your pickling line





PICKLING LINE CONTROL, especially designed to the job, features magnetic amplifier regulators for quick response, and complete coordination from entry to delivery section. Allis-Chalmers motors and generators are coordinated with this precision control.

The continuous flow of steelmaking requires step-by-step coordination through the main mill to final process lines. All along the line, Allis-Chalmers control is tailored for each specific operation — yet designed with *your* entire system in mind.

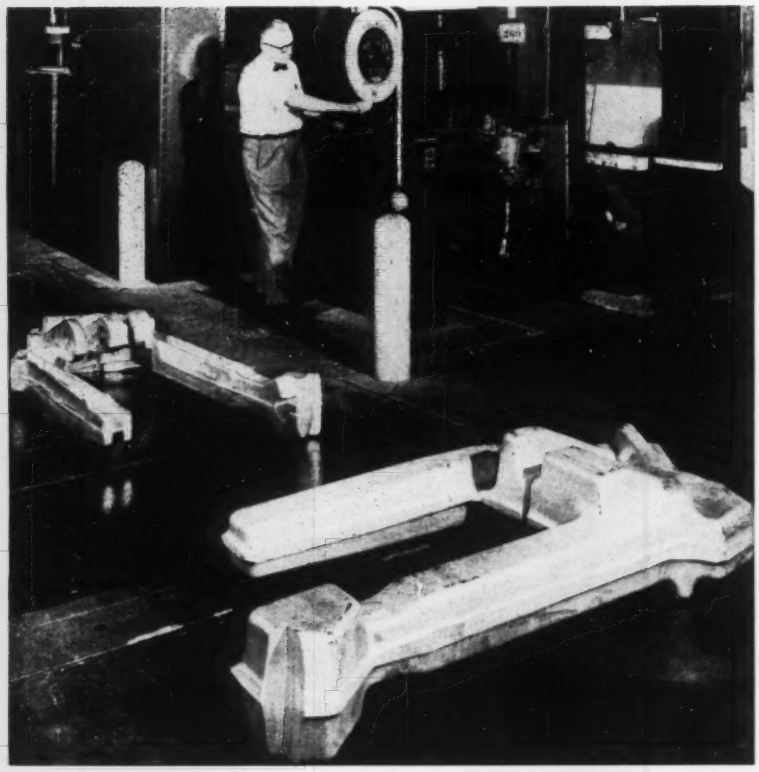
Backed by A-C engineering skill and comprised of quality components, this custom control gives accurate speed and tension regulation from bloom to sheet. It means ultimate control for maximum steel output.

That's why Allis-Chalmers control is gaining more and more acceptance in the mills. Contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

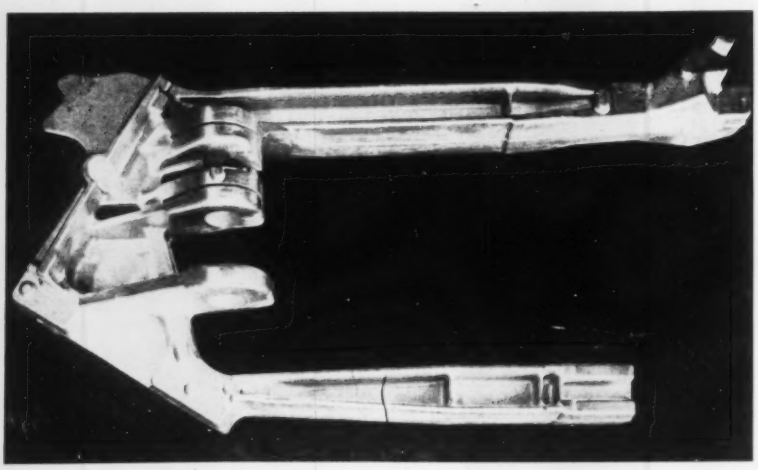
A-C ALLIS-CHALMERS

A-5450



Blocker type forging in the foreground required 750 lb less machining than the contoured hand forging it replaced. The blocker type forging was in turn replaced by the precision forging in the background

Presses Cut Forging Costs



Only 59 lb are removed in machining this 289-lb forging made on the Air Force's 50,000-ton press. The part must withstand the landing impact of a 400,000-lb bomber

THE CLOSE approach to final dimensions that the Air Force's heavy presses make possible is illustrated by the landing gear part at left.

Parts leave the presses at dimensions formerly reached only after extensive machining. Less machining, material, and manhours are needed; waste and shipping costs are reduced.

Case History—The main landing gear bulkheads of the B-52 Stratofortress have been the target of an extensive cost cutting and weight saving program planned by Boeing Airplane Co., Seattle. Forging techniques developed at Aluminum Co. of America's Cleveland plant have cut machine manhours 62 per cent and saved thousands of dollars in machining costs for each set of bulkheads. The aluminum originally needed for one set now produces eight.

The savings are the result of forging each aluminum part in the bulkhead to precision tolerances.

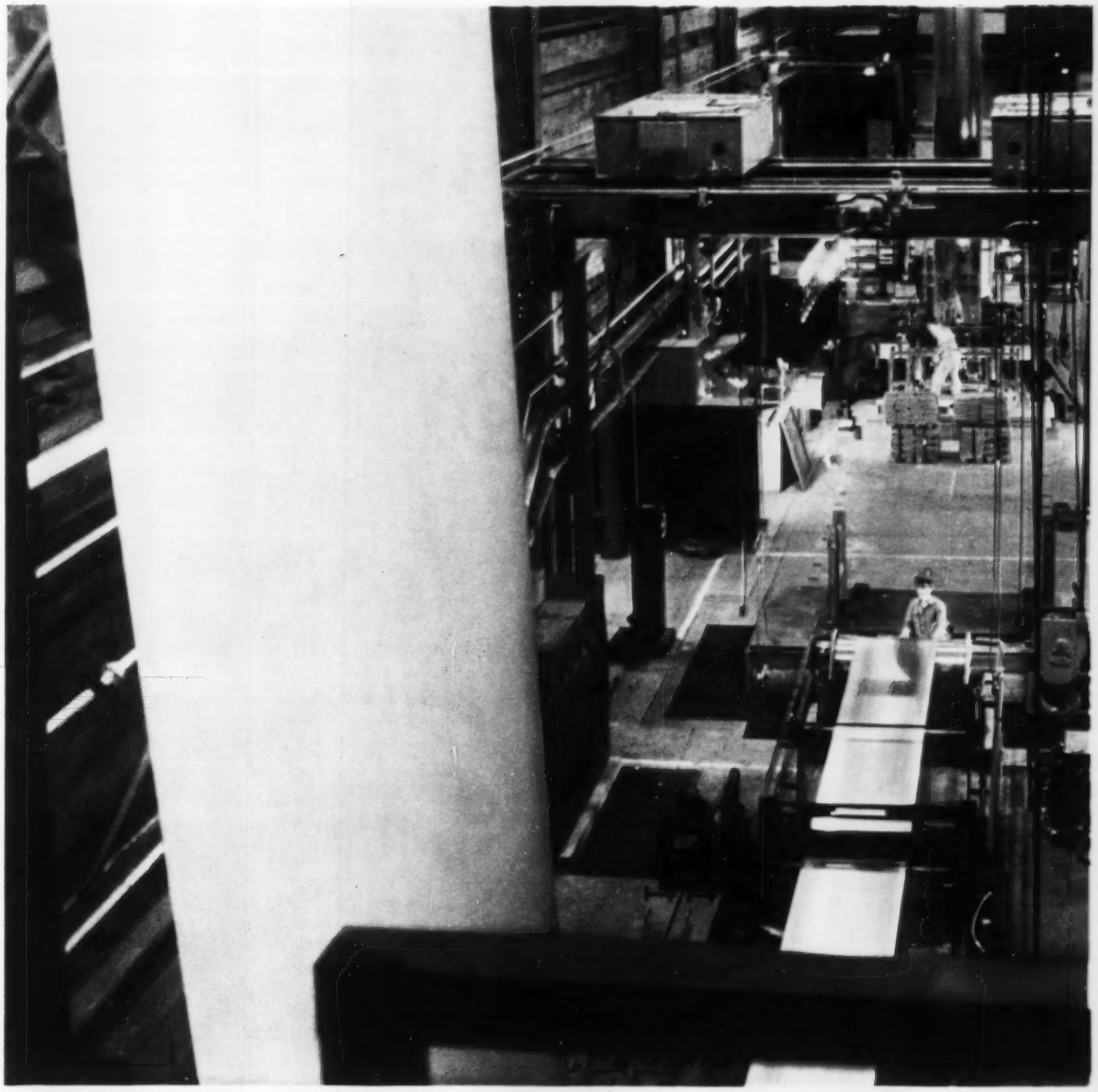
Example — The landing gear trunnion, an impact-absorbing part shaped like a giant tuning fork, was first produced by machining 1300 lb of aluminum from a 1625-lb hand forging.

This forging was made by pressing and shaping a blank between flat dies until it had a rough outline of the finished part.

Boeing and Alcoa cut costs by replacing the hand forging with an 875 lb, blocker type die forging. It was machined to a 230-lb part. This type forging is made by squeezing a blank (smaller than is needed for hand forging) between a single set of impression dies to obtain the finished product's general shape. This forging cut 750 lb from machining and was the best that could be made with the then existing maximum press capacity of 15,000 tons.

Alcoa now uses the Air Force's 50,000 ton press to precision forge the trunnion. It leaves the press weighing 67 per cent less than the blocker-type forging.

The cost reduction history of the trunnion has been matched by that of the bulkhead's side members. In additon, Alcoa now forges the side members with a no-draft surface so precise that the plane's aluminum skin can be attached to them directly.



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JalZinc is available in a wide range of gages and widths in both cut lengths and coils. It can be furnished in coating weights from 1.00 oz. to 2.50 oz. per sq. ft., depending on your end product needs.

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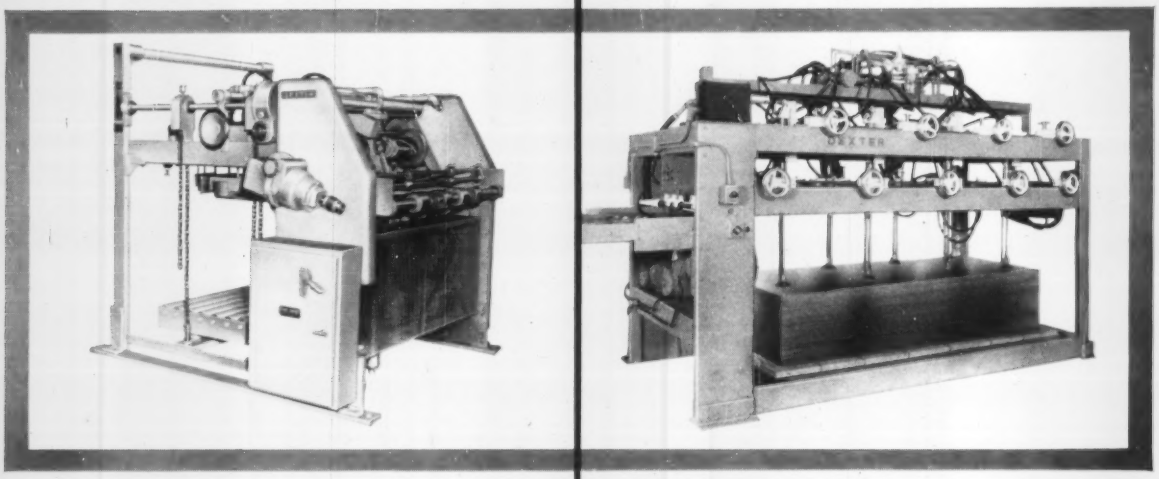
NEED HELP WITH

Sheet Handling Problems?



Dexter 9000# H.D. Feeder runs at speeds up to 9000 sheets of tin plate per hour. Used primarily in most major metal decorating plants.

Dexter Plate Feeder handles metal plates up to 3/16" thick and a maximum size of 4-by-12 feet. Used in many plants for feeding descaling equipment.

CHECK WITH DEXTER

Dexter's been designing and building sheet handling equipment for over 75 years...*sheet feeders* for metal decorating presses, scroll shears, punch presses, coaters, slitters...*pack turnovers* for speeding up two operation processes...*oven strippers* and *pilers*...*cardboard* and *corrugated board feeders* for presses and packaging lines ...*paper feeders* for printing presses, varnishers and folding machines. For almost any sheet feeding problem Dexter has the answer...with its wide range of equipment.

Dexter Feeders are available in over a hundred sizes, speeds and load capacities to suit individual machine or process requirements. Sheet sizes range from 14 x 14" to four by twelve feet...sheet thickness from .006" to 3/16" or more...load capacities from 6,000 to 30,000 pounds ...and speeds from 600 to 9000 per hour!

Thousands of Dexter sheet handling machines are in use today in container plants, electrical equipment factories, appliance manufacturing plants, in tin plating lines, printing and binding companies, and in a wide variety of other industries...speeding up production efficiently and economically.

If you need help with your sheet feeding problems—check with Dexter. Their combination of engineering experience and equipment flexibility may be the solution for increasing your productivity.

Write or call for complete details.

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FOLDER COMPANY
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Deburring Titanium

Strip breakage during stretch forming is greatly reduced by a smooth radius on edge

THE device in the illustration (below) removes burrs on the edge of titanium strip. It does the work of eight men using 48 files.

The machine was developed by engineers at the Los Angeles division of North American Aviation Inc.

Breakage—When stretch formed, titanium tends to tear or crack wherever there is a rough edge or shear fracture. Such edges look smooth, but they require deburring.

North America's device pulls strips through a series of cutting tools. They are radiused to produce a smooth, rounded edge.

When strips were hand filed, up to 75 per cent would break in stretch forming. That has been reduced to 1 per cent. Quality also has been improved.

CUTTERS
. . . radius strip edges

Savings—With the old method, each man required six vixen files per day to produce 32 acceptable parts. The new method turns out the same quantity in 1 hour. Cutter costs are about 50 cents per day.

The method evolved after trials of rough grinding and burr wheels. At first, edge preparation was a carryover of methods used on steel and aluminum.

Industry Seeks a Decimal

The goal: A tenth of a millionth of an inch. To get it, manufacturers are working with the Bureau of Standards. They're also looking for a better interferometer

METALWORKING'S continuing drive for tighter tolerances is trouble enough to production men, but the real burden falls on gage builders. They have to make their products to a fraction of production tolerances; and then they must turn out master gages accurate enough to check the production gages.

A "crash" program underway will get these gage builders another decimal point closer to perfection. The goal: A tenth of a millionth of an inch.

Co-operative—More than a dozen manufacturers are co-operating with the Bureau of Standards in a program with a double objective. First, master gage blocks must be developed that can be reliably and absolutely stabilized to a tenth of a millionth. Second, interferometers must be improved so they can be used to accurately measure these levels of precision.

New metals and combinations of metals are being tested for more stable gage blocks. New pure light sources and combinations of sources are being tried in advanced interferometers. In the laboratory at Sheffield Corp., Dayton, Ohio, for example, atomic lamps are one type of light source being studied.

Importance—Success of the project will make possible more reliable and uniform gages and techniques. It will also help speed the development of better precision products like missiles. A missile's working parts may require machining and measuring to tolerances as close as 4 millionths of an inch. Some of these products already are on the drawing boards, awaiting the success of this project.

Companies involved include: Sheffield Corp., Ford Motor Co., New Departure Div. of GM, General Electric, IBM, Du Pont, Van Keuren, Dearborn Gage, Taft-Pierce, Pratt & Whitney, DoAll Corp., Hughes Aircraft, Greenfield Tap & Die, and Timken.

Auto Influence

How important is the automotive industry to machine tool prosperity? There are no statistical data to pin the relationship of automakers' buying programs to over-all machine tool prosperity, but it's no secret that the influence is fairly strong.

The present dip in machine tool orders, for example, can be traced largely to silence from automotive capital goods buyers. A spokesman for the National Machine Tool Builders' Association says that if the automotive business had held up, machine tool orders would add up to an extremely good year. Many builders continue to look to a fall upturn in Detroit.

Production Boost

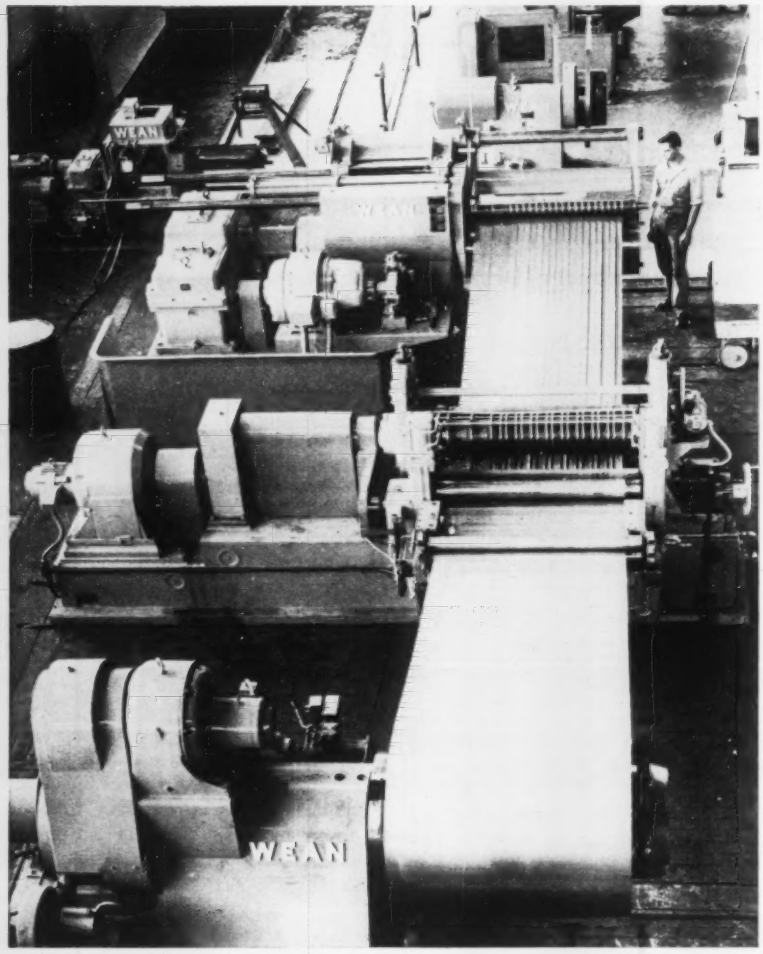
At least one builder is boosting production to meet demand for his machines: The newest member of National Acme Co.'s (Cleveland) line of automatics is going over with a bang. It's the 6 spindle, 7/16 in. bar automatic, the smallest of the company's machines.

Unit Count

The number of machine tools produced last year by U. S. builders fell just short of 64,000.

Distributor's Meeting

The annual meeting of the American Machine Tool Distributors' Association is set for Cleveland, Sept. 23-24. The program will highlight service problems. A panel session will delve into the handling and servicing of parts.



Slicing to size is the first operation. Coil (foreground) is 48 in. wide, weighs 30,000 lb. Outstanding feature of line is a 200-ton flying press. Top speed: 200 strokes per minute for 18 in. lengths

SPS Automates Stamping

From double-size coils, this line slits, edge conditions, blanks, and details without interruption. It's part of a $1.8 million expansion program for its Hallowell Div.

THE coil slitter in the illustration is the first unit of a new, $330,000, high-speed production line at the Standard Pressed Steel Co., Jenkintown, Pa. The firm makes shelving, shop and school furniture, and precision aircraft fasteners.

Made by Wean Equipment Co., Cleveland, the line is scheduled for completion in October. It features a 200-ton flying press, said to be the largest outside the auto industry. Steel shelves up to 36 by 46 in. can be sheared, blanked, pierced, and detailed in a single stroke.

Features — Major benefits expected from the line include: 1. Increased flexibility. 2. Smoother production. 3. Reduced scrap.

SPS formerly purchased sheet steel in several sizes and trimmed them to meet production requirements. Large coils permit production economies, faster deliveries with fewer inventory and handling problems.

Units of the line can be operated singly or in sequence. Large coils can be slit and the smaller ones recoiled for later use. The line will edge condition slit coils in widths of $\frac{5}{8}$ to $7\frac{1}{2}$ in.

By slitting to exact widths and shearing to proper length, SPS expects to cut scrap by as much as 50 per cent.

Unusual Design — The flying press has a rotary motion which permits steel fabrication without stopping the strip. It has no flywheel, clutch, or brake. For 18-in. feed lengths, the unit can operate at 200 strokes a minute.

Skip sequencing of the die stroke permits the press to turn out extralarge sheets. Lengths are limited only by building dimensions.

The new line also includes a high speed, high capacity slitter for reducing wide coils to small sizes; an edge conditioner for the smaller coils (up to $7\frac{1}{2}$ in. wide); and a scrap baler for waste trimmings from the slitting line.

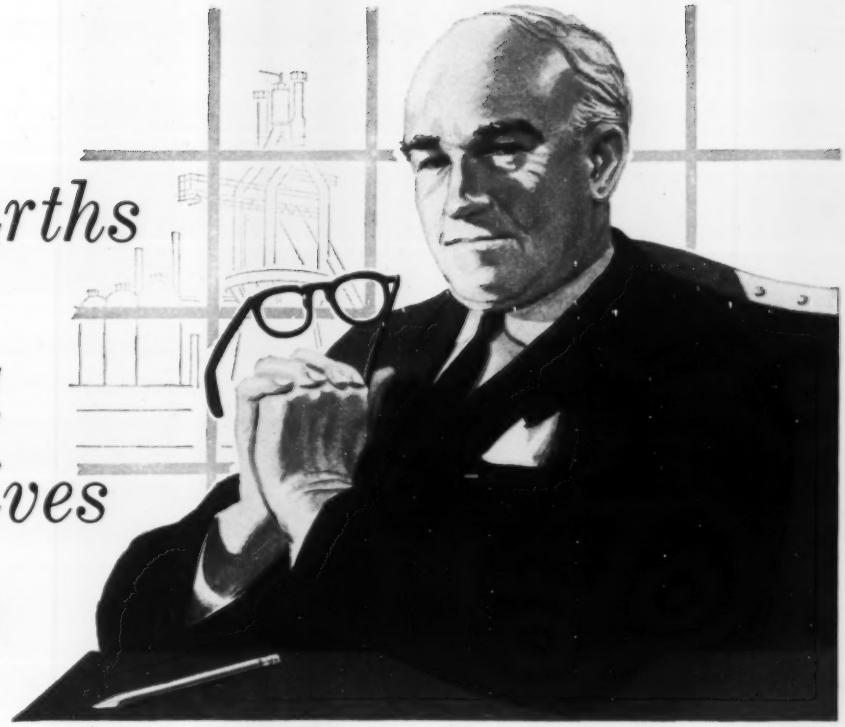
Looking Ahead — Addition of the line is a part of a $1.8 million modernization and expansion of SPS' Hallowell Div. It is also adding 105,000 sq ft of production space.

The firm is banking on major economies from the use of outsize coils—the equipment handles 48-in. coils which weigh up to 30,000 lb. That's twice the normal size for such operations.

The new line is more than 210 ft long. SPS says that it gives the Hallowell Div. one of the most flexible and modern pressed steel fabricating shops in the country. Components will be made and stored, rather than made to order.

Rare Earths and Steel Executives

?



- Interested in producing low-carbon steels
- Decreasing production man-hours
- Increasing shippable yields

Man-hours of production cost and shippable yields now afford the steel producer just about the only opportunity for improvement to meet price and quality competition.

The addition of but small quantities of MCA rare earth materials frequently results in valuable savings in surface preparation costs and increased shippable yields, both of which have been demonstrated in production runs. Plate steels, deep-drawing sheet steels, low-carbon steels, silicon and stainless steels, and steels demanding transverse properties are among those especially susceptible to improvement with rare earths.

The substantiated proof of rare earths in steel-making economy and MCA's technical knowledge are unsurpassed. Write or call today for details.

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MCA

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Aluminum ingots unitized for safer, faster handling

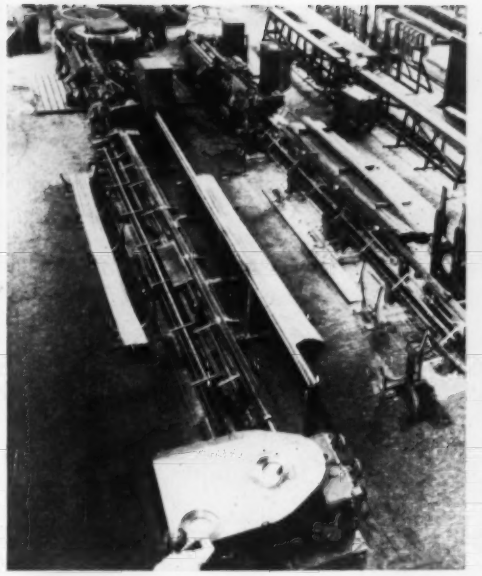
U. S. Reduction Company, East Chicago, Indiana, sought a way to keep unitized aluminum ingots from loosening or coming apart during handling and shipping. Working with their Acme Idea Man, a method of unitizing the ingots with heavy-duty Acme Steel Strapping was developed. (Idea No. U6-16)

Now, flat steel straps keep ingots tightly bound into a solid, secure unit. Output of unitized ingots per day is higher, handling and storage safer, easier. Units stay tight and secure during shipment. And customer complaints due to loose ingots are virtually non-existent.

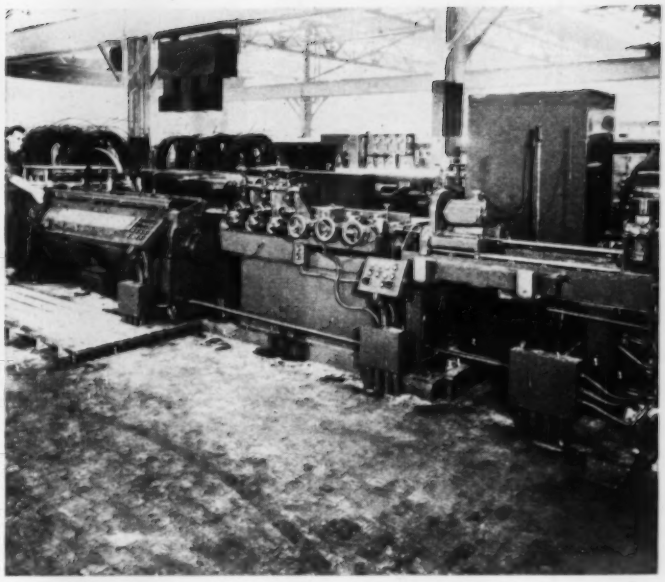
An Acme Idea Man like Andy Bassi can help you solve product protection problems.

***Work with your Acme Idea Man.** Profit from his help as U. S. Reduction Company does. He has an extensive file of performance-proved ideas that can help you save time and money, build greater customer good will. Write Dept. SDU-97, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**



Over-all view of the processing line. Stock enters at the far end



Entry end includes continuous drawbench, vertical and horizontal roller straighteners, and saw

Tubing Line Cuts Costs, Ups Quality

One operator controls this high speed machine. Product is made from rough coil stock for use in refrigeration, heating, and plumbing equipment

COPPER and brass tubing are continuously finish drawn, straightened, cut to length, and recoiled at Chase Brass & Copper Co., Cleveland.

The processing line, built by Loma Machine Mfg. Co. Inc., New York, handles ¼ to ¾ in. OD tubing at the rate of 200 ft a minute.

Continuous processing offers several advantages:

- Greater output rate: High speed operation.
- Reduced labor cost: Only one operator is required.
- Improved straightness: The tubing is straightened in two planes.
- Roundness: It's obtained by straight line drawing action.
- Reduced floor space: Intermediate transport and storage are eliminated.
- Ease of packaging: Tubing is ready for shipping.

Stock is finished in straight lengths within an 8 to 30 ft cutoff range, in pancake or dual layer coils ranging from 25 to 100 ft long, and in bunch type coils weighing 100 or 200 lb.

How It's Made—The line has an uncoiler, drawbench, roller straightener, flying cutoff, automatic discharge conveyor, and recoiler.

One or more of the components may be eliminated. For example, the recoiler may be eliminated if straight lengths are specified.

All the components used in a sequence are interlocked mechanically and electrically. The operator has free time during the run so he can prepare the next coil.

Continuous Drawbench — This high speed unit gives a straight line draft of about 25 per cent.

After loading the uncoiler, one end of the coil is pointed on a swaging machine. If the floating plug method of drawing is used, the plug is swaged into tube end.

The pointed end is inserted into the die of the drawbench by the operator.

Stock is pulled through the tungsten carbide die by the back-and-forth movements of two carriages. The built-in jaws open and close automatically as the carriage is reversed. Movements of the carriages overlap so that the stock continuously advances through the die.

The movement of the two carriages is controlled by cams cut

LIKE CLOCKWORK, Eastern's automated *in-touch* control system gives you customer service data in a matter of minutes.

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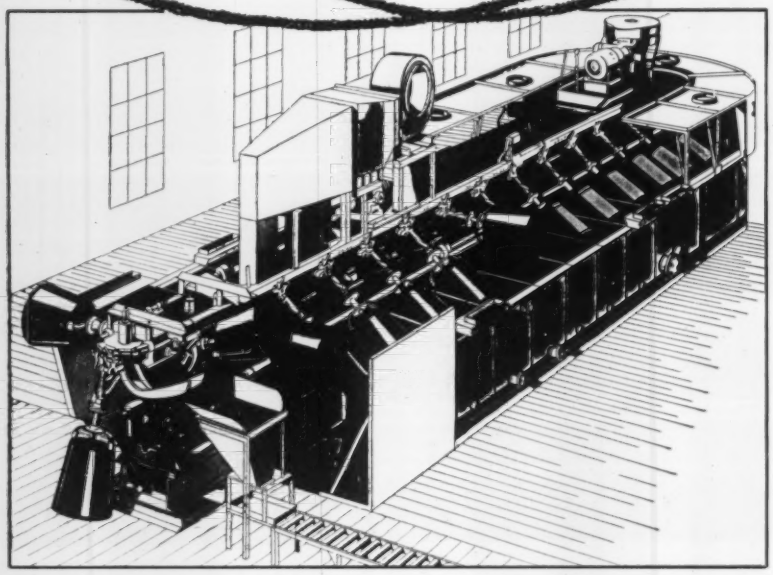
17th Century Fob Watch, courtesy Metropolitan Museum of Art, New York
Exploded Watch Movement, 1645-70, courtesy Methuen & Co., Ltd., London

Barrel Plating by Stevens Really Cuts Costs



Since Stevens first introduced the Automatic Barrel machine scores of industries have enjoyed these operational advantages. Check them against your present operations.

MINIMUM LABOR REQUIRED — In most cases, one unskilled employee can operate the machine.

HANDLES THE COMPLETE CYCLE — Including cleaning, pickling, chromate treatments, plating, bright dip and drying.

COMPLETELY AUTOMATIC — No barrel lids to fasten and unfasten during automatic loading and unloading.

BETTER HANDLING — No mixing of parts. Becomes a part of a straight line production system.

NO HEALTH HAZARD — Occupational health hazards eliminated with ventilation of equipment.

UNIFORMITY OF PLATE — Accurate plating cycles timed to meet your requirements.

FITS ANY PLANT LOCATION — Does not need special buildings—Can be moved at any time. Low head room.

DEPENDABLE — Scores of machines in use. Machine design and construction constantly improved.

LOW INITIAL COSTS — For average operation lowest initial machine costs.

LOW MAINTENANCE COSTS — Proven over years of use and in varied operations

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TUBING . . .

into two rotating drums underneath the frame of the drawbench. The drums are operated from the main motor.

Gripping jaws contact the tubing from all sides and operate under a low pressure. This eliminates surface marks on tubing.

The drawing die can be adjusted to assure the straight line advance of the tubing.

Roller Straightener—From the drawbench, tubing passes through a vertical and a horizontal set of rollers. Each set has six rollers; three are driven by a common motor.

To give the straightening effect, rollers are adjustable out of line by calibrated handwheels that set the saddle exactly.

Rollers are mounted on overhung shafts, giving the operator a clear view of the stock.

Flying Saw—It travels with the stock. During the advance of the saw and stock, the motor moves downward. The motion is controlled by the slope of a guide bar.

The downward movement for the cutting operation can be controlled by adjusting the height of the saw motor.

The start of the advance movement is actuated by a limit switch that is adjusted to control the length of tubing.

During the cut, the stock is held by collet type clamps which open and close automatically. The cut tube is pulled out of the saw by a pair of motor driven pinch rollers mounted on the saw frame.

Discharge — Upon leaving the flying saw, any one of the three operations may be performed:

1. The straight, cut-to-length tubing is piled in cradles mounted adjacent to the discharge conveyer.

2. If a precise cutoff length (1/32 in. tolerance) is required, the tubes are cut with a slight overlength on the flying saw. A precision cut is made with a second saw. The tubes are automatically discharged into the piling cradle.

3. Stock is guided to a recoiler at the end of the line if it is specified for pancake, dual layer, or bunch type coils. One adjustable and two stationary rollers form and discharge the coil.

How T&W Technique is applied to serve the construction equipment industry better

If you are building construction equipment, investigate *T & W Technique* for producing forgings and deep drawn stampings. At the right are two examples of how a fully coordinated team of engineering and production facilities at T & W's Forging and Stamping Divisions serve industry better.

Send a sample or print of your part, today, for estimates.

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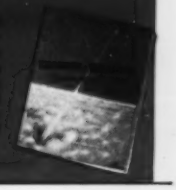
Forgings and Deep Drawn Stampings

The valve cover produced in our Stamping Division measures 7¾ inches wide, 16⅞ inches long and 3⅝ inches deep. You can depend on T & W for your stamping requirements.

The double roller-type forging weighs 117 pounds, largest diameter 12 inches.

Write for this 20-page booklet, "Forgings & Stampings Challenge the Future," explaining how T & W technique produces forgings and stampings that cost you less at your point of assembly.



FORGINGS AND DEEP DRAWN STAMPINGS

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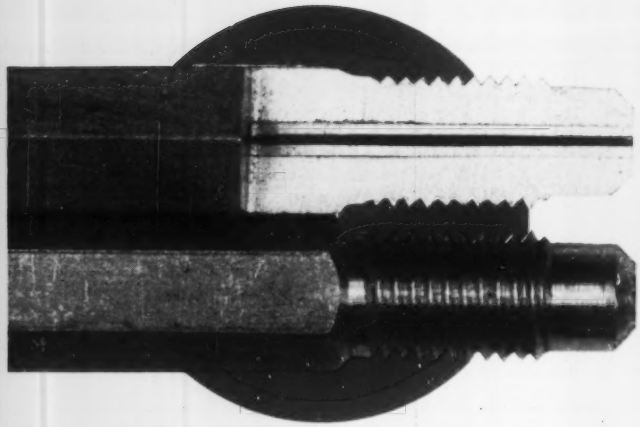
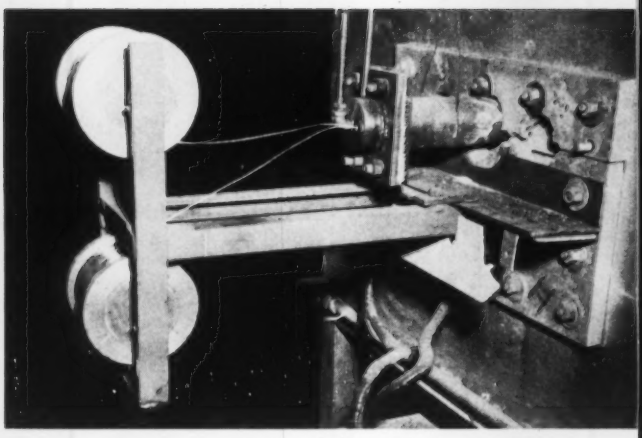


1 Capillary stainless tubing encased in aluminum



2 Fine nickel wire clad with Inconel

Ideas for Difficult Jobs

PRECISE fabrications of wire and tube products are solving some of today's toughest problems. Photos above show examples of what is being done by J. Bishop & Co., Malvern, Pa.

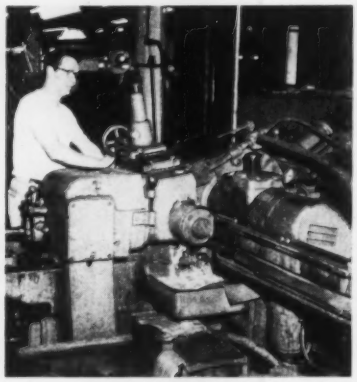
1 This is a 304 stainless capillary tube covered with aluminum. It's an applicator tube which helps regulate the flow from a large pressure container such as an aerosol bomb.

Bishop cuts stainless capillary tubing into a short length at specific tolerances. This is inserted into a shorter length of an hexagonal outside diameter aluminum tubing with a round inside diameter. The capillary tubing insert is positioned so that each end has a protrusion to minimize the danger of contamination and clogging during subsequent operations.

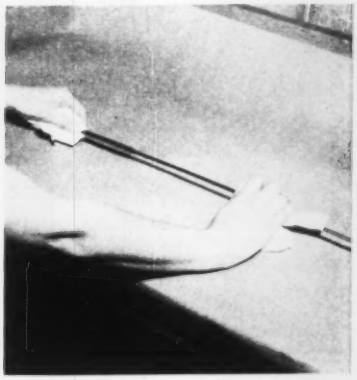
Bonding—Both ends of the assembly are swaged for a short distance. This reduces the diameter of the aluminum and firmly bonds it to the stainless insert. The next operation is to form and thread the swaged ends to allow

MAKING INCONEL CLAD NICKEL WIRE . . .

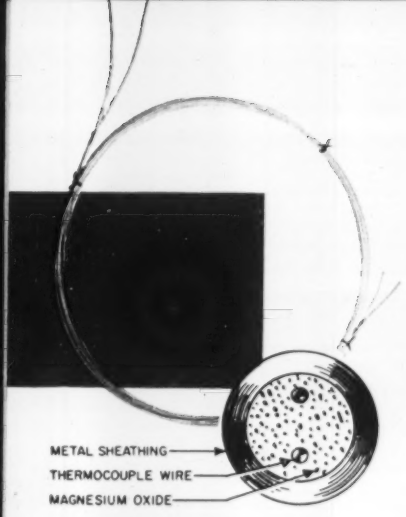
Inside diameter of Inconel tube is blasted as doublecheck on cleanliness



Centerless grinder takes nickel wire from diameter of 0.235 to 0.232 in.



Wire is inserted into tube. Both have been wiped with acetone



3 Flexible thermocouple wire with metal sheathing

The possibilities of fabricated composites are limited only by the designer's imagination

for the addition of a control valve and nozzle.

The stainless protrusion is removed and a 0.016-in. steel wire is inserted to insure delivery of a dust-free, clean inside diameter. The assemblies are polished on all machined surfaces to remove any burrs and smooth the metal.

Other Uses—Capillary tubing of this type finds many industrial uses. It's important to instrument makers in the transmission of temperature variations to actuate remote control mechanisms or indicators.

It's generally produced from the 300 series stainless with a bore ranging from 0.006 in. to 0.030 in. and an outside diameter of 0.060 in. to 0.125 in. Under controlled conditions it can be produced to a total bore tolerance of ± .0005 in. It's commonly produced to a total tolerance spread of 0.003 in.

2 This fine nickel wire clad with Inconel is used in atmospheres which would be detrimental to nickel. Basic specifications that Bishop must meet:

Outside diameter of composite wire—0.012 in. ± .0005 in.

Thickness of Inconel sheath—0.0017 in. ±0.0003 in.

Tensile strength—75,000 to 87,000 psi.

Cladding must be unbroken and free of kinks, burrs, deep pits, deep scratches, and any foreign deposits.

Bishop starts with an Inconel tube having a 0.385 in. OD and a 0.045 in. wall thickness. The nickel wire is 0.235 in. in diameter.

Photo sequence below shows steps in making the clad wire. Both wire and tubing are thoroughly cleaned before the composite is put together. After the initial draw, 23 more are required to reduce the composite to the 0.012 in. specification.

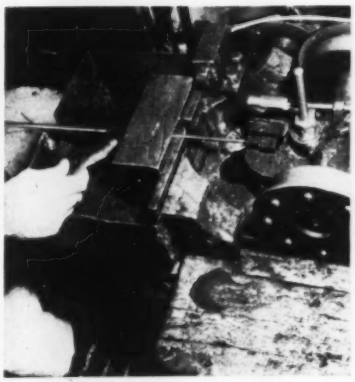
Others—Bishop makes stainless and platinum clad copper and platinum clad silver. They are used in electronics where the conductivity of the base wire is important and there's need to protect it against oxidation.

Gold Cladding — Another composite developed to solve atomic problems is long, gold clad, stainless steel tubing. The thin gold cladding is pinhole-free. The tubing is used in heat exchanger applications where the heat transfer media on the shell side are corrosive to stainless (gold protects it) but where stainless is resistant to the media on the tube side.

Sheets—Precious metal sheets for contacts are made with 0.001 in. cladding of a silver-gold alloy which acts as a solder. The solderable backing makes it possible to place the small units upon the contact assemblies and automatically solder them by running the assembly through a furnace.

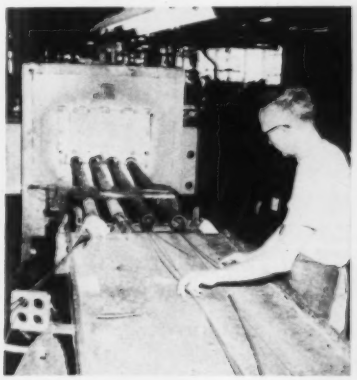
3 This is a small thermocouple wire fabrication that simplifies on-the-spot use. It can be stripped with a file and pliers to make hot or cold junctions in a matter of seconds.

Bishop works with 25-ft coils. Short magnesium oxide insulators are put over the positive and negative wires by hand. The assembly is inserted into a 304 stainless or Inconel tube (the sheath) which is drawn tight on the insulators. This provides permanent insulation between the two resistor wires and the sheath. Honeywell's new "Meg-



The first drawing operation takes the composite to 0.310 in.

Vapor degreasing readies the composite for annealing



Automatic annealing at 2000° F is used between draws

An Entirely New Concept

15,000 LB. MODEL

Greatest stability at every stage of 120 inch lift

Dotted line above shows how Automatic Elbolift's built-in retraction feature maintains maximum stability every inch of its 120" lift. Tilting action illustrated is operated by a single control lever which can tilt and/or lift load separately or simultaneously.

AUTOMATIC TRANSPORTATION COMPANY

Division of The Yale & Towne Manufacturing Company

101 West 87th Street, Chicago 20, Illinois

in Fork Lift Truck Design...

Automatic ELBOLIFT!

12,000 TO 20,000 LBS. CAPACITIES

Eliminates Mast Assembly...Weighs 6000 lbs. less than any comparable mast-type truck...is definitely superior in stability, maneuverability, and operator vision.

370% More Visibility: Picture at left dramatically illustrates the increased visibility over conventional, mast-type, heavy duty trucks. Forks completely visible when entering pallet.

Drive tires two-thirds of Elbolift's width: 32 lineal inches of the truck's 48" overall width are in contact with the floor for the greatest load distribution and stability.

All conventional ideas of fork lift trucks were scrapped in designing this newest in the long, distinguished line of Automatic "firsts." Only in this way could Automatic engineers achieve the marked improvement in capacity, maneuverability, safety, performance and weight reduction which they had set as their goal.

The result is a truck with capacities from 12,000 to 20,000 lbs. —15,000 lb. model 48" wide, and 143" long (less forks) is actually *three tons lighter than any comparable mast-type truck.* This permits the Elbolift to operate on floors that would be unsafe for other types of comparable capacity.

Its unique design is also responsible for other advantages ...among them the following:

Exclusive New Power Steering Control—takes the guess work out of steering. *Operator always knows* the exact direction of his steer wheels by the position of the steering lever.

Shortest Inside Turning Radius—does more work, handles heavier loads in less space. Operates easily in 13'8" right angle aisle and 78" boxcar door with 52" square load.

Highest Lift With Lowest Overall Height—Elbolift has 79" overall height with a 120" lift.

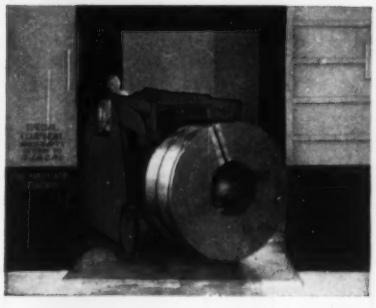
Safety—Easy on—easy off. Operator completely protected by counterweight on both sides and heel plate in the rear. Dead man control...returns speed controller to neutral and automatically applies brake when driver dismounts.

Exclusive New Inching Control—4 speeds forward and reverse with foot inching to any preset or selected speed.

Battery Accessibility—battery on rollers for quick and easy removal from either side.

But there's ever so much more than can be adequately described here. Why not get the whole story? No obligation. Just mail the coupon below...mail it today.

Maneuverability: Carrying a full load of 15,000 lbs. (52" square), the Elbolift passes easily through any 78" boxcar door...will right angle stack a 52" load comfortably in a 13'8" aisle.



Versatility: Ram attachment at left can be quickly and easily replaced by adjustable forks for handling dies, pallets, etc.

AUTOMATIC TRANSPORTATION COMPANY
77 West 87th Street, Dept. P-7, Chicago 20, Illinois

Rush me fully illustrated descriptive brochure on the revolutionary new Automatic Elbolift Trucks.

Your Name_____ Title_____

Firm Name_____

Address_____

City & Zone_____ State_____

YOU GET more* WHEN
YOU BUY BEARINGS FROM
YOUR Bunting®
DISTRIBUTOR

*more precision

QUICK, EASY ASSEMBLING, perfect functioning and trouble-free maintenance are assured by Bunting's precision. Precision requirements in the manufacturing of Bronze Bearings and Bars go far beyond mere dimensional accuracy. There is precision in the metallic composition and in every factory operation required to produce Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Stock Bearings and Bars. Precision in the handling of the customers requirements is the common characteristic of Bunting distributors whose ample stocks of these products are always at your command.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

All Bunting Sintered Bronze Plain and Flange bearings stamped with part number—an exclusive Bunting feature.

Bunting

BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS OF CAST BRONZE AND POWDERED METAL.

The Bunting Brass and Bronze Company • Toledo 1, Ohio • Branches in Principal Cities

apak" thermocouple wire uses this product.

Advantages—The combination of alloy sheathing and magnesium oxide insulation has many advantages. The wire is usable up to 1400° F and has long life. It's flexible and can be bent around twice its own diameter.

The needs of atomic projects brought about the new thermocouple concept. Now it's being used in such applications as measurement of temperature in heat treating furnaces, annealing covers, blast furnaces (during the drying out process), boiler tubes and jet engine testing.

More to Come—Ellis E. Comfort, president, J. Bishop & Co., says: "Advances in scientific fields have been reflected in a demand for precision metal fabrication.

"Our experience working with the platinum metals led us into other fields—particularly stainless and nickel alloy tubing. We have pioneered the development of many products requiring exacting workmanship and have seen them grow into standard mass produced items."

Applications for composites are as broad as the designer wishes to make them. Speaking of wire, Mr. Comfort says his company can produce: "Any combination of precious metals over precious metals, precious metals over base metals, base metals over precious metals or base metal combinations in sizes down to 0.001-in. in diameter."

Vacuum Plating Cadmium

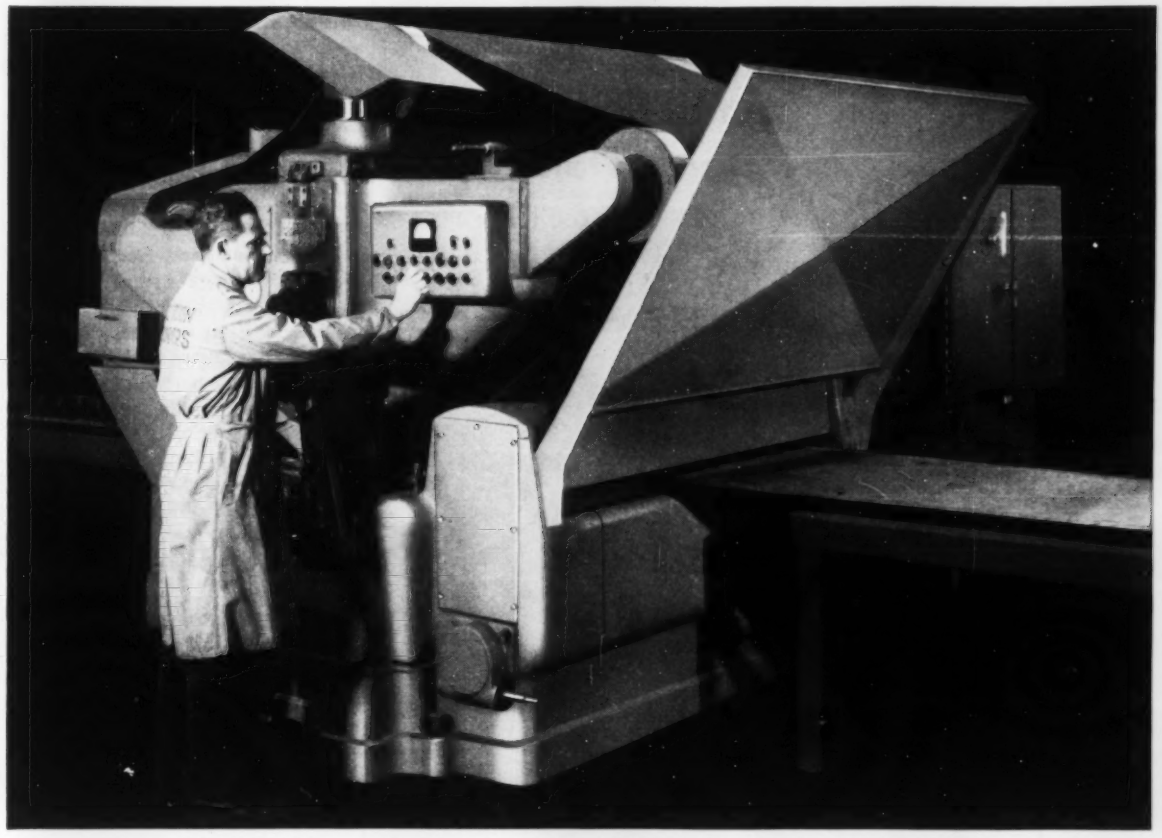
HYDROGEN embrittlement in cadmium plating on steel has been eliminated by a vacuum process. It was developed by Lockheed Aircraft Corp. and Anadite Inc., South Gate, Calif.

Process—The parts are suspended in a vacuum chamber, and the cadmium is vaporized beneath them. No current is passed through the parts, so they remain at room temperature.

Results—The coating meets all military specifications for electrolytic plating, including corrosion resistance and adherence.

Deposits of 0.0003 to 0.0005 in. are made on high strength steels (tensile strength of 180,000 psi or higher).

GRINDS SHEET STEEL OR STRIP TO IMPROVED FINISH IN A SINGLE PASS!



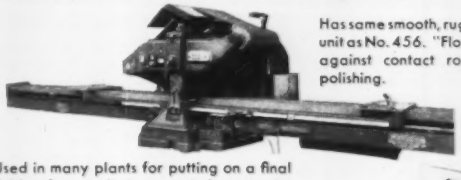
Rugged New Pinch Roll Grinder by Mattison eliminates chatter and revolution marks!

Put a stop to customer rejects and speed production of titanium, zirconium, stainless, and carbon steel sheets, plates, or strip . . . grind to correct gauge thickness . . . and make your production more automatic by installing this new Mattison No. 456 Pinch Roll Grinder. It's a heavier, more rugged machine capable of producing No. 3 finish with a 100 grit belt *in a single pass*. Diamond design improves belt performance and reduces belt cost. There's no vibration or chatter —you get high-quality finishes even on light-gauge steel. High horsepower permits you to grind accurately to size. Positive stops control parallelism within close limits. Photocell control of the grinding aperture (optional) prevents the leading edge of the sheet from marking the belt, eliminating "pickup" on subsequent sheets.

MATTISON MACHINE WORKS ROCKFORD, ILLINOIS

HIGH-POWERED PRECISION SURFACE GRINDERS

NO. 455 RECIPROCATING TABLE SHEET POLISHER



Has same smooth, rugged head unit as No. 456. "Floats" sheets against contact roll for fine polishing.

Used in many plants for putting on a final finish after preliminary grinding on the No. 456.

SEND for new illustrative bulletin, with complete facts and features.

Mattison Machine Works
545 Blackhawk Park Avenue, Rockford, Illinois

- ☐ Please send bulletin on No. 456 Pinch Roll Grinder.
- ☐ Please send bulletin on No. 455 Wide-Belt Sheet Grinding and Polishing Machine.
- ☐ Please send literature describing Tube Grinders.

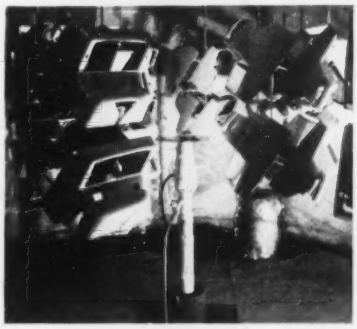
Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

IBM relies on **RANSBURG NO. 2 PROCESS Electrostatic Spray Painting** to get the excellent and uniform high quality wrinkle finish on all **IBM ELECTRIC TYPEWRITERS**



Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

Problem Licked

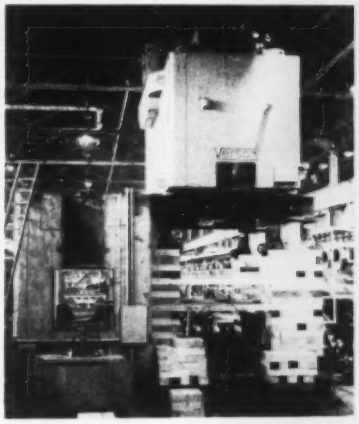
Where installation is too close to production, try this method of raising heavy parts

RIGGERS at Kelsey-Hayes Co., McKeesport, Pa., were faced with the problem of raising a 200-ton press crown 17 ft without interfering with nearby production.

The solution: Eight air motor screw jacks and blocking.

Unusual Method—Normal installation practice is to use a gantry crane and rigging. "Too dangerous," said John Kunz, project manager. "Nearby conveyors and production stations would be too close everytime we hoisted a beam or frame."

The crown is 10 ft square and 22 ft long. Eight jacks were placed, two under each corner. Alternating, half of them were used to raise the crown while riggers built up blocking under the other half.



JACKS AND BLOCKING
. . . replace gantry crane method

The crown was moved into position on the jacks with a winch and rollers. The procedure was repeated when the part had been raised. The job took less than 10 hours; the gantry method would have taken seven days.

How They Work — Mechanical screw jacks turned by air motors (made by Duff-Norton, Pittsburgh) won't creep once they're locked. When the full limit of the raise is reached, a shutoff stops the motor. A keyway in the ram prevents load shifting. Only 80 lb of air pressure is needed to operate them.

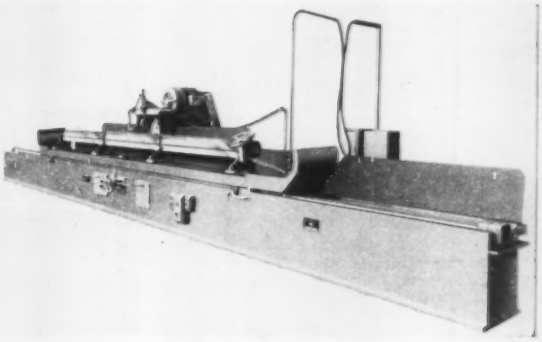
Knife Grinder Has Traveling Table

Model 300 comes in capacities of 78 to 300 in.

The carriage travels in self-aligning ground ways, one V and one flat. The totally enclosed spindle is dynamically balanced, hardened, and ground. Preloaded ball bearings are used to eliminate end thrust or side movement.

The grinding head unit adjusts to do either concave (hollow) or flat bevel edge grinding. The hydraulic table operates at speeds up to 100 fpm.

The swiveling knife bar has four finished sides complete with knife or shear mounting slots. *Write*: Samuel C. Rogers & Co. Inc., 2070 Sheridan Dr., Buffalo 23, N. Y. *Phone*: Victoria 8600



Fork Lift Truck Line Eliminates Mast Assembly

The Elbolift MF is only 80 in. high but will lift 120 in. Capacity ranges from 12,000 to 20,000 lb.

The truck is 48 in. wide. Load stability is provided by two 16-in.-wide tires.

Tiering is made easy. The truck tilts forward 10 degrees, backward 5 degrees.

A dead-man control automatically applies the brake and returns the controller to neutral when the driver dismounts.

The battery compartment has rollers to make it easy to remove the battery from either side. *Write*: Automatic Transportation Co., division of Yale & Towne Mfg. Co., 149 W. 87th St., Chicago 20, Ill. *Phone*: Radcliffe 3-7000

Belt Grinders Finish Titanium, Stainless, or Carbon Steel

This line of pinch roll grinders finish flat stock to precise gage thicknesses. Machines come in four sizes, with capacities of 36, 48, 60, and 72 in.

Speeds of the feed rolls can be adjusted from 1 to 100 fpm.

The top idler roll can be adjusted vertically for correct tension and cambered for belt alignment. (It is cambered automatically to produce the proper action of belt across work.)

Feed and work rolls are designed so that material can be fed with the rotation of the belt or against it with equal efficiency.

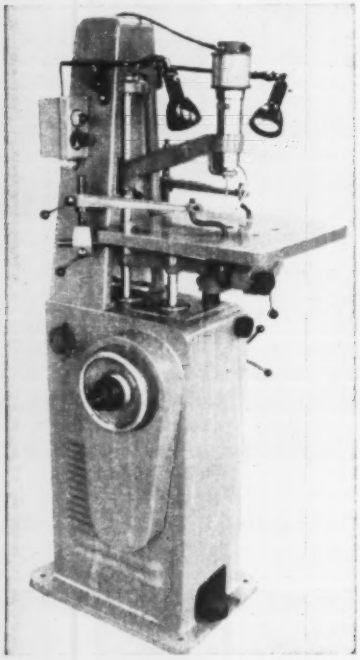
Main drive motors of 40 to 150 hp are used, depending upon machine size. *Write*: Mattison Machine Works, 545 Blackhawk Park Ave., Rockford, Ill. *Phone*: 2-5521

NEW PRODUCTS and equipment

Toolmaking Machine

The Rotor Recipro makes rotary and reciprocating motions simultaneously.

It uses diamond tools, carbide files, grinding points, and carbide burrs to machine tool steels, carbide form cutting tools, contoured tungsten carbides, and hardened steels.



An interchangeable file bracket makes it possible to do conventional tension and compression filing, as well as sawing and honing.

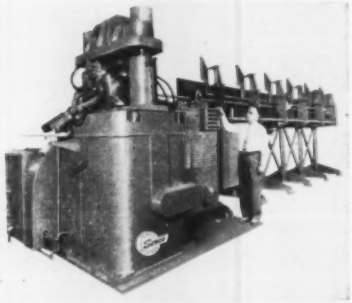
The reciprocating motion (85 to 500 strokes a minute) is combined with rotary speeds rheostatically controlled up to 45,000 rpm.

The fluted work table is 18 x 18 in. It tilts 10 degrees in any direction. *Write*: Connecticut Tool & Engineering Co., Round Hill Road, Fairfield, Conn. *Phone*: Clearwater 9-7801

Feeder Cuts Off Bars

This unit consists of a bar stock storage rack and loader, a hydraulic gripper bar feed, and a short-stroke underdrive cutoff.

Various diameters can be processed. The model illustrated handles bars from 1 to 2 in. in diameter. Parts from machine finished bars are cut to a tolerance of 0.1 of an ounce.



Bar leads and trailing ends are both treated as scrap. They are separated automatically from the good parts. *Write*: Sesco Inc., 8881 Central Ave., Detroit 4, Mich. *Phone*: Texas 4-1701

Air Clutches

PO clutches (8, 10, and 11½-in.) are suited for machinery and equipment. They are available in triple, double, and single plate construction and have a maximum torque capacity of 3503 lb-ft.

A cartridge - type diaphragm (made of neoprene reinforced with nylon) eliminates leakage.

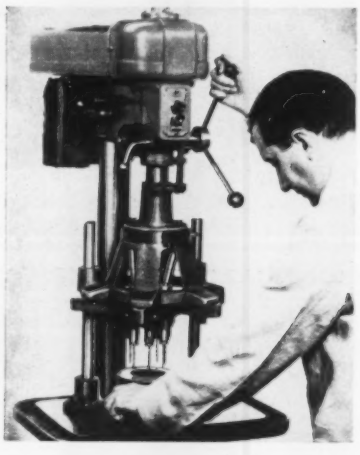
Narrow widths of the units allow them to replace drum or band clutches. *Write*: Twin Disc Clutch Co., Racine, Wis. *Phone*: 4-5664

Multiple Heads

These adjustable spindle heads will drill or tap an almost unlimited variety of hole patterns.

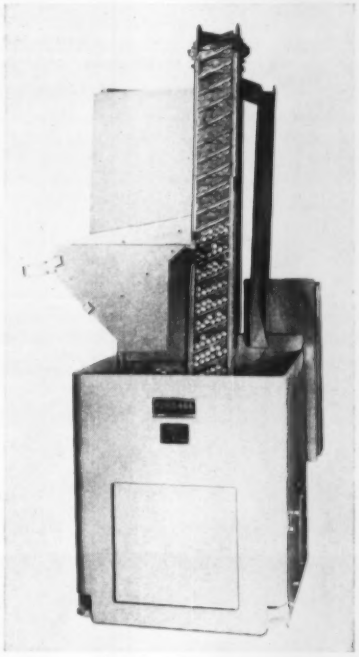
Model 600 has six spindles, Model 800 has eight. Both have a circle type spindle arrangement.

Spindles can be located anywhere within a 3 in. diameter. Minimum center distance is 15/16 in. *Write*: Ettco Tool & Machine Co. Inc., 594 Johnson Ave., Brooklyn 37, N. Y. *Phone*: Hyacinth 7-4400



Part Feeder

Model 2200B is an elevating conveyer and automatic part feeder which can handle up to 200 ball sockets a minute. It orients and feeds them into a production machine.



The variable speed drive of the conveyer makes it possible to adjust the feed rate.

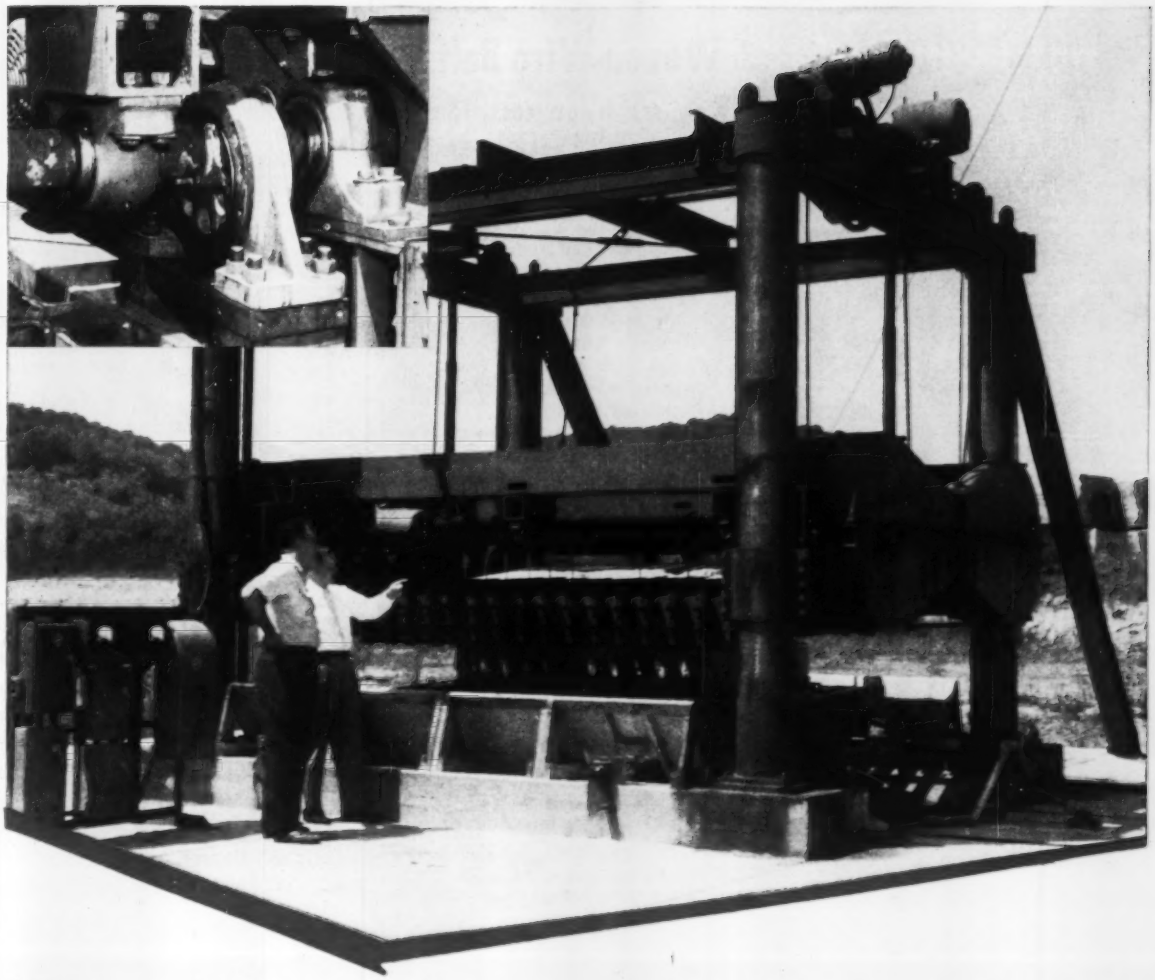
Angle of conveyer elevation, depth of cleats, and orienting position can be varied to suit a wide range of rolling or sliding parts. *Write*: Feedall Inc., Willoughby, Ohio. *Phone*: Willoughby 2-8100

Gasket Assembly

This machine eliminates the assembly line problem caused when gaskets slip out of place or fall off before their assembly is complete.

The machine spots a hot melt adhesive on the gaskets which holds them in place in about 5 seconds.

The T-922 adhesive is supplied in cakes to fit the tank which heats



Bearings, Inc. helps engineer first change in stone sawing since the year 1.

It took over 1957 years to bring about a basic change in stone saws! A Bearings, Inc. service engineer helped this customer, a stone company in Central Ohio, make this change for more accurate, high-speed stone sawing. Previously, stone "sawing" had actually been a process of grinding stone away with the help of abrasives.

Now, an eccentric bearing (shown above) specially designed by our engineers accurately controls movement of the blades into the work and with the use of carboloy tools on the blades, *stone is now actually cut for the first time.* No abrasives are required and cutting speeds are many times faster than with the old method.

You may not have a stone cutting problem but if your problem involves bearings . . . get the competent services of bearing experts who sell and service the best nationally known lines of bearings and accessories. Call the stock carrying branch nearest you now!

Providing bearing service in the territories adjacent to our branches, listed below.

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
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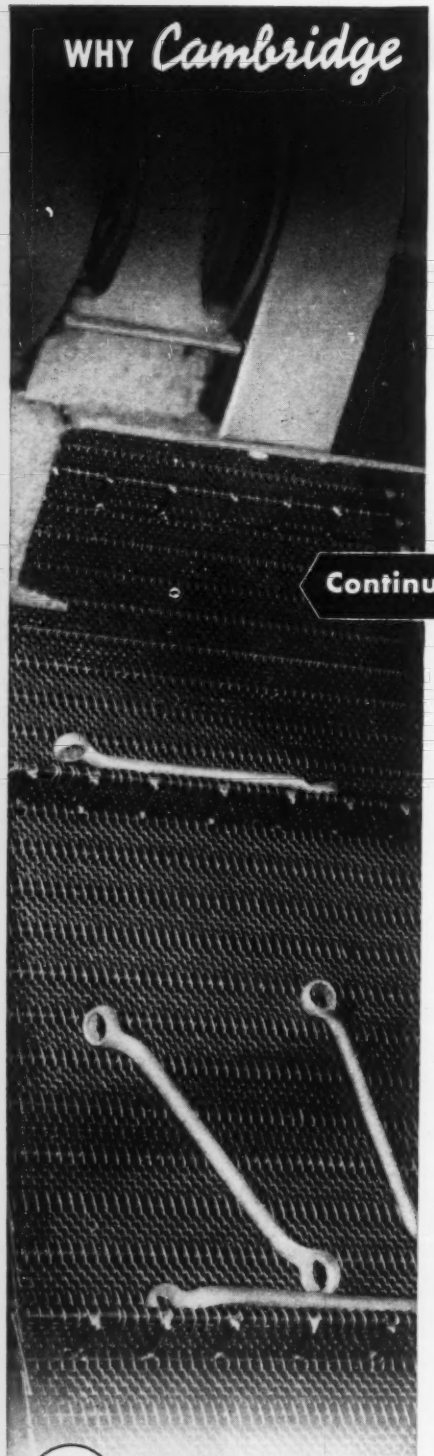


WHY *Cambridge* **Woven Wire Belts**

mean low cost, continuous heat treating

Baskets and manual handling become things of the past, treatment is more uniform, capacity increases . . . *if* you eliminate batch operation and combine movement on woven wire conveyor belts with annealing, brazing, quenching, oiling, tempering, sintering. Your products move continuously in a belt-to-belt flow all through the heat treat cycle, process costs drop in all departments. FOR EXAMPLE:

Continuous Quenching

ALL-METAL BELT moves wrenches out of quench tank continuously, dumps and returns for more. Woven wire construction from corrosion-resistant alloy provides lasting strength . . . has no seams, lacers or fasteners to break or wear.

SPECIAL CROSS FLIGHTS pick up parts from tank, hold them on the belt during inclined travel.

OPEN MESH permits rapid drainage of quench solution, quick drying of parts—also provides free circulation of atmosphere in furnace cycles for more uniform annealing and brazing.

OPTIONAL CHAIN DRIVE provides positive motion for heavy loads or inclined movement. Friction drive easily handles most loads.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut costs with continuous processing on woven wire conveyor belts. Look for his 'phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department J, Cambridge 9, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

NEW PRODUCTS and equipment

it. The tank holds enough adhesive for 20,000 to 30,000 gaskets. *Write*: Armstrong Cork Co., Lancaster, Pa. *Phone*: Express 7-5151

Powered Curve

This 90 degree roller curve is made in fixed or variable speed models. The rollers are tapered and driven by a chain.

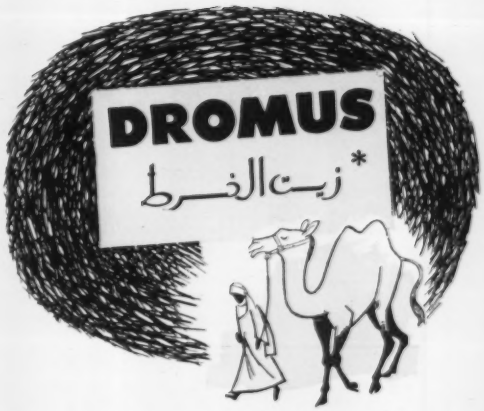
The powered rollers are used when a package cannot negotiate a 90 degree turn by gravity. *Write*: Sage Equipment Co. Inc., 30 Essex St., Buffalo, N. Y. *Phone*: Elmwood 5242

Welding Guns

These tools are cooled by incoming water. It reaches the welding point through a tube that is insulated almost its entire length by the return water jacket.

The return water jacket has a

No matter how you say it . . .



*TRANSLATION: CUTTING OIL

The performance and the brand are the same around the world

Other Outstanding Shell Industrial Lubricants

Shell Tellus Oil—for closed hydraulic systems

Shell Alvania Grease—multi-purpose industrial lubricant

Shell Turbo Oil—for utility, industrial & marine turbines

Shell Rimula Oil—for heavy-duty diesel engines

Shell Talona R Oil 40—anti-wear crankcase oil for diesel locomotives

Shell Dromus Oils, a quality line of soluble cutting oils, permit higher speeds and greater feeds while extending tool life. They have excellent wetting and cooling properties and are not sticky or greasy.

Dromus® Oils have the added advantage of being easy to mix in hot or cold, hard or soft water. They form emulsions which remain stable in practically any concentration required in the shop.

Today Dromus Oils are available to your customers abroad. You can be sure that they will enjoy the same efficient performance your domestic customers rely upon.

• • •

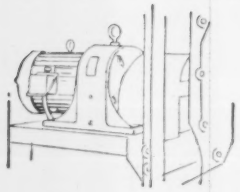
For more information, write Shell Oil Company, 50 West 50th Street, New York 20, N. Y., or 100 Bush Street, San Francisco 6, California.

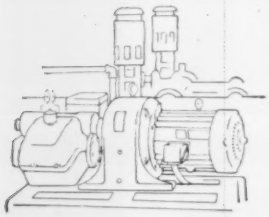
SHELL DROMUS OILS

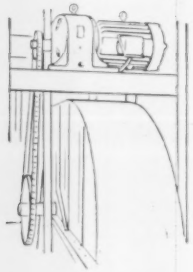
SHELL

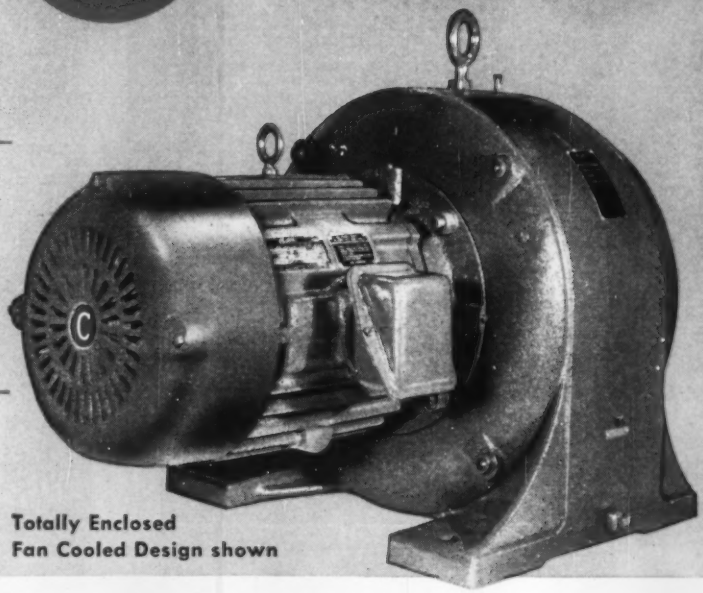
SLOW SPEEDS...TOP EFFICIENCY!

new completely redesigned Century-powered GEARMOTORS





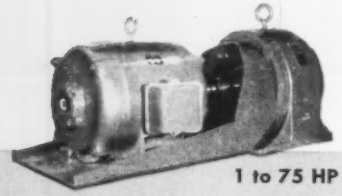




Totally Enclosed
Fan Cooled Design shown

Single, double and triple reduction available with output speeds from 750 to 7.5 RPM. 1 to 125 HP.

the right combination of quality motor and quality gearing for trouble-free service:



1 to 75 HP

Ideal where quick motor interchangeability is necessary. Double and triple reduction units with output speeds from 350 RPM to 7.5 RPM.

- **Performance-Rated© polyphase, single phase and DC Motors**
- **Duti-Rated Lifetime High-Capacity Gearing**

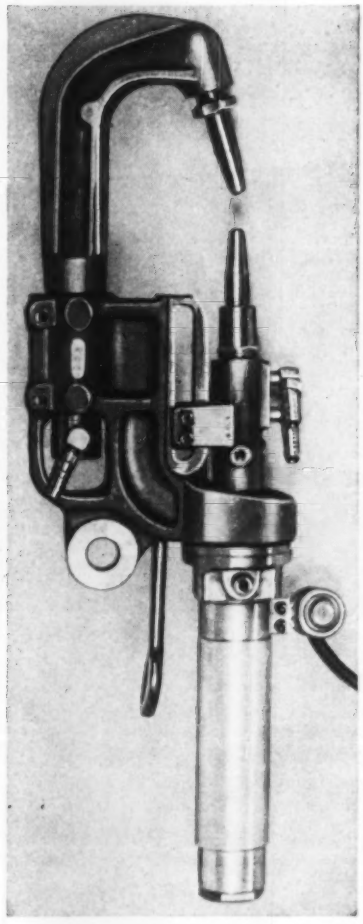
Newest improvements in gearmotor design—assure you top efficiency in all your slow-speed power applications! Century Gearmotors combine famous Century motor quality and precision gearing to give you increased dependability, cooler operation, maximum wear life . . . trouble-free service even under your heaviest loads! Variety of mounting positions available including downshaft and tilted shaft.

Performance-Rated to your specific needs . . . available in open drip proof, dust proof, explosion proof and totally enclosed frames. Call or write your nearby Century District Sales Office or Authorized Distributor.

Performance-Rated© MOTORS 1/20 to 400 HP

CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points In Principal Cities*



capacity five times that of the inflow tube. Heat transfer to the inflow tube is said to be much less than with small diameter, cast in, return water tubes that build up excessive heat in the jaw extension.

Models include C and scissors type, with either the upper or lower jaw operating. *Write*: Allied Welder Corp., 8700 Brandt, Dearborn, Mich. *Phone*: Luzon 4-4770

Machine Punches, Bends

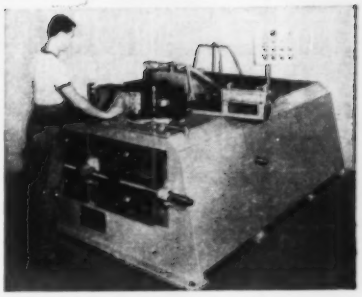
This combination horizontal punch press and multiple bending machine produces 1440 parts an hour. It uses press bending principles to pierce and countersink holes, flatten, coil weld projections, and produce multiple bends in two parts at a time.

The machine is adapted to the production of tubular furniture, automotive and aircraft molding and trim. It will also handle angular, square, or rectangular sections.

A two-pump hydraulic system is used. Under no-load conditions, both the high and low pressure pumps feed the system to provide high ram speeds.

During piercing, forming, and clamping operations, where high pressures are required, the low pressure pump is automatically cut out.

Bending and sequencing operations use the low pressure pump



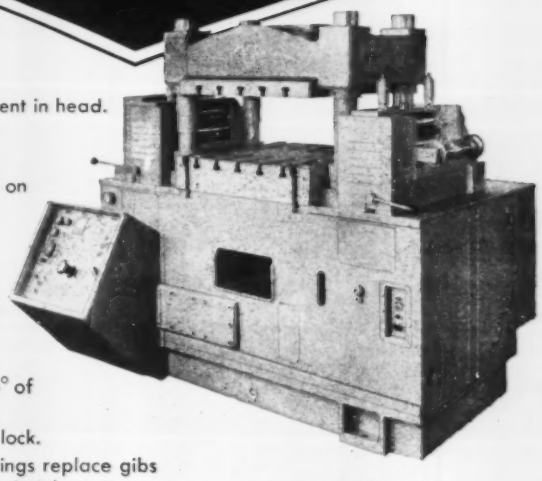
only. The high pressure pump maintains the clamping force.

Wing dies on the machine can

ALPHA
TWO POINT
BACK GEAR UNDER DRIVE
PRODUCTION PRESSES
Capacity of 75 to 200 tons

Outstanding Features

- Shut height adjustment in head.
- Center drive type herringbone gears.
- Scrap cutter action on up-stroke of press.
- Cam adjustments for brake & roll feeds.
- Micro adjustment of metal travel.
- Timing of scrap cutter from 0° to 45° of up-stroke of press.
- Positive shut height lock.
- Bronze sleeve bearings replace gibs as utilized on conventional presses.



These precision presses are basically precision operating, high-speed automatic stamping presses. They have built-in precision in the same terms as the word "precision" is associated with modern machine tools. This inherent quality has been designed into these presses from the ground up.

NO PITS REQUIRED.

UNBALANCED DIES can be handled without distortion.

FAST, ACCURATE, WILL GIVE LONG TROUBLE-FREE SERVICE and LONG DIE LIFE.

PRESSES UP TO 300 TON CAPACITY, AVAILABLE TO CUSTOMER PARTICULAR REQUIREMENTS.

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ALPHA PRESS & MACHINE, INC.

9281 Freeland Avenue • Detroit 28, Michigan

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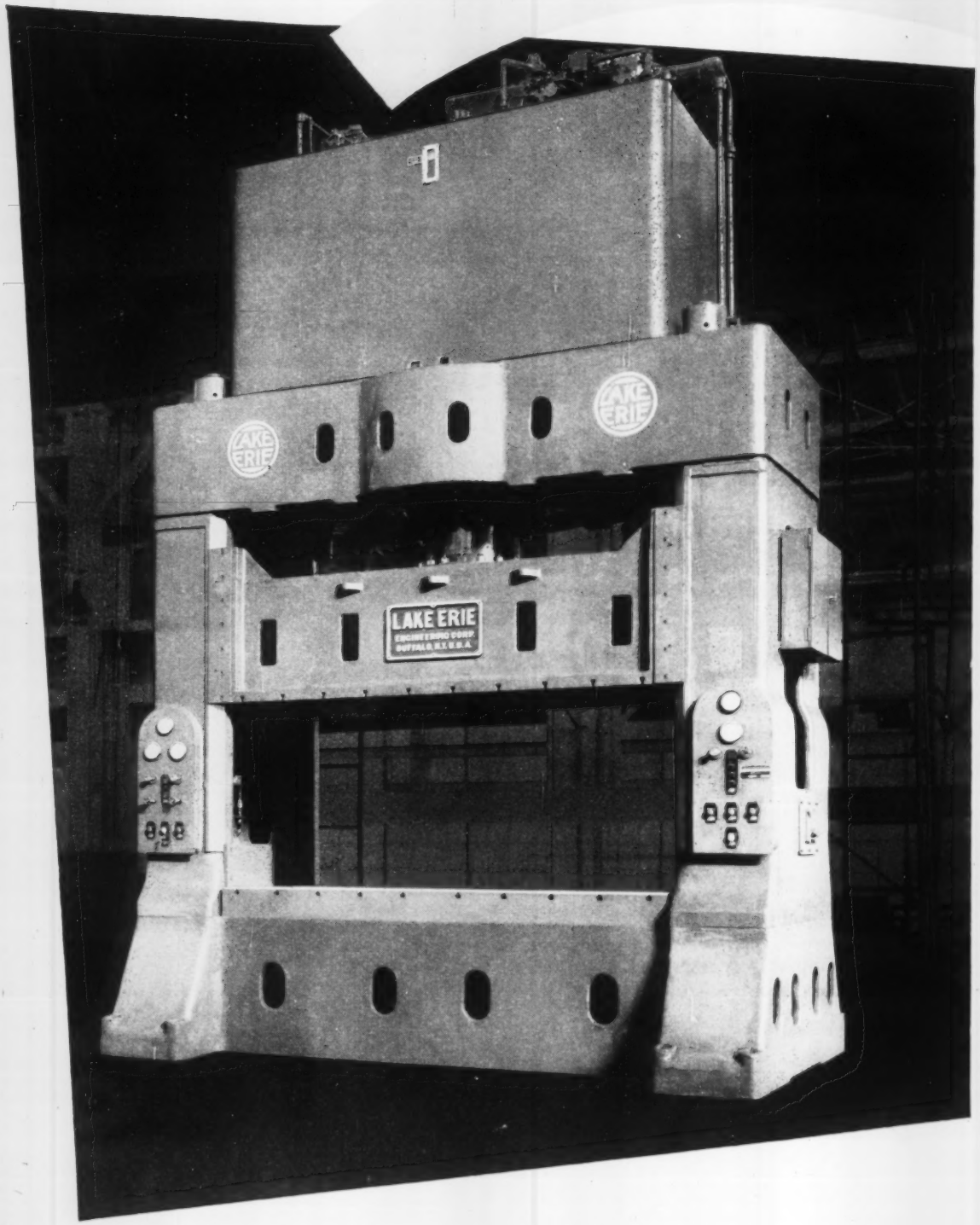


KEY TO SUPERIOR PRESSES

FORGED STEEL CYLINDERS... *eliminate possible failure of integrally cast cylinders.*

HEAVIER SECTIONS... *mean lower stresses.*

LAPPED CYLINDERS AND PISTONS... *insures precision fit.*

QUICK-SET STROKE CONTROLS... *save time on set-ups.*

UNUSUALLY RUGGED SIDE HOUSINGS... *increase frame rigidity.*

FAIL-SAFE DEVICES... *in electric and hydraulic circuits.*

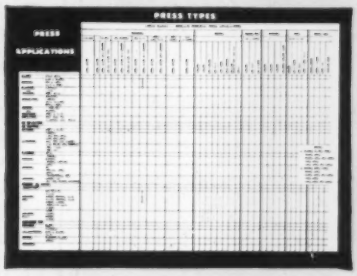
SIMPLIFIED ELECTRICAL SYSTEM... *designed for maximum safety and ease of maintenance.*

BRONZE USED EXTENSIVELY... *bronze throat bushings provide better guiding.*

... *bronze piston heads, gland bushings, and pre-fill valve disc prevent scoring.*

LAKE ERIE BUILDS THEM BETTER... Mechanically, electrically, and hydraulically, Lake Erie presses bring you the greatest number of superior features. That's why Lake Erie press users almost always return to us for additional presses. They know from experience that Lake Erie incorporates many "special" features as "standard"... features which seldom if ever form a part of customer specifications. They know that these features mean longer press life, minimum maintenance, maximum productivity. Next time, call on Lake Erie.

SEND FOR HANDY BUYER'S GUIDE



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ROLLING MILL AUXILIARY EQUIPMENT

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MANUFACTURING NATIONALLY FOR 54 YEARS

Punches, Dies, Rivet Sets, "Heatproof" Compression Dies.

Round, square, oblong Punches, Dies and Rivet Sets carried in stock.

Write Dept. A for catalog 54 and new stock list.

GEO. F. MARCHANT COMPANY
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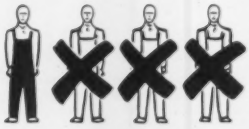
SILENT HOIST LIFTRUK

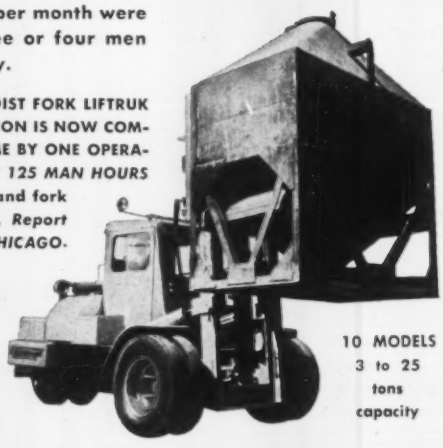


INLAND STEEL IS SAVING approx. 125 MAN HOURS EACH MONTH on JUST ONE SPECIFIC REQUIREMENT

"Four to six cars of carbide per month were formerly unloaded by three or four men working eight hours per day.

"THROUGH THE USE OF SILENT HOIST FORK LIFTRUK Model FK 7½, THIS SAME OPERATION IS NOW COMPLETED IN A PORTION OF THE TIME BY ONE OPERATOR . . . *SAVING APPROXIMATELY 125 MAN HOURS PER MONTH*" . . . releasing men and fork truck for other useful purposes. *Report from INLAND STEEL CO. EAST CHICAGO.*

SILENT HOIST LIFTRUK is a real work horse — operates long periods without maintenance — on muddy or irregular terrain. STANDARD EQUIPMENT includes Fluid Drive, Power Steering, High Undercarriage, extra large torque multiplier for traction.



10 MODELS 3 to 25 tons capacity

Ask for Bulletin No. 77.

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

NEW PRODUCTS and equipment

be reversed in position and action to form S-shaped sections. *Write*: Walter P. Hill Inc., 22183 Telegraph Rd., Detroit 19, Mich. *Phone*: Kenwood 4-9190

Teeming Ladle

This ladle can carry 150 tons of steel although its shell weighs only 38,200 lb. The refractory lining (6½ in. thick) weighs 37,600 lb.

Alloys are not used in the ladle's construction, nor is strength reduced. Heavy box-section bands and shell stiffeners are used for a high strength-to-weight ratio.

The combination brick ring and top stiffener is cast in segments for convenient maintenance. *Write*: Pennsylvania Engineering Corp., New Castle, Pa. *Phone*: Oliver 4-5511

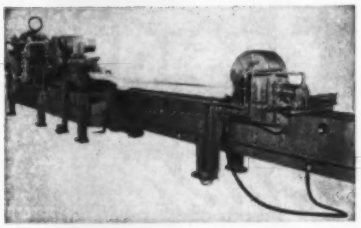
Extrusion Stretchers

This line of hydraulic stretching and detwisting machines is for straightening ferrous and nonferrous sections.

The stretchers are available in sizes up to 200 tons. They handle extruded or rolled bars, tubes, structural shapes, or sheets and strip. Lengths of 4 to 100 ft are stretcher-leveled at high production rates.

An optional tailstock is open. This allows the stock to protrude past the gripping jaws. Extrusions of varying length may be gripped and stretched without moving the tailstock every time or trimming

NEW PRODUCTS and equipment



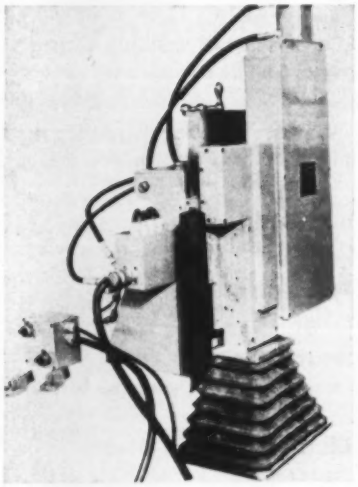
the extrusions to uniform length. *Write*: Loma Machine Mfg. Co. Inc., 114 E. 32nd St., New York 16, N. Y. *Phone*: Murray Hill 5-6410

Wheel Dresser

Model 86 is a hydraulic contour wheel dresser for use on cylindrical grinders.

The dressing diamonds are set optically in the microscope fixture so that no dresser adjustments are necessary when changing diamonds.

Profile widths up to 6 in. and depths to 3½ in. can be handled. The dresser can be tied directly into the grinding cycle for fully automatic operation.



Uniform peripheral diamond dressing speed is possible. *Write*: Hoglund Engineering & Mfg. Co., 343 Snyder Ave., Berkley Heights, N. J. *Phone*: Crestview 3-7183

Belt Grinder

Model PD-10 is a 10 in., abrasive belt unit suited for dry, flat surface grinding; and polishing and deburring of castings, diecastings,

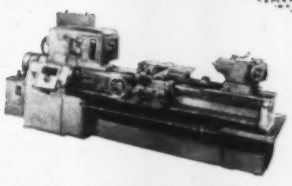
This inflationary spiral you will like!

Up she goes in a happy swoop—because this spiral indicates the *inflated machine tool output* you can achieve with a little judicious investigation—today.

To be sure, there are such unhappy upward spirals as are furnished by inflated labor and materials costs—but when you offset them with our Monarch type of inflation, there goes your profit spiral up in a happy swoop, too! Here's how:

Use Monarch Dyna-Shift Lathes. You get more speeds—a wider speed range—automatic speed selection for the desired surface cutting speed—a machine under full load during the entire cutting cycle. Result—productivity increase up to 25%; tool life up as much as 50%.

Write today for facts. You can't afford not to!

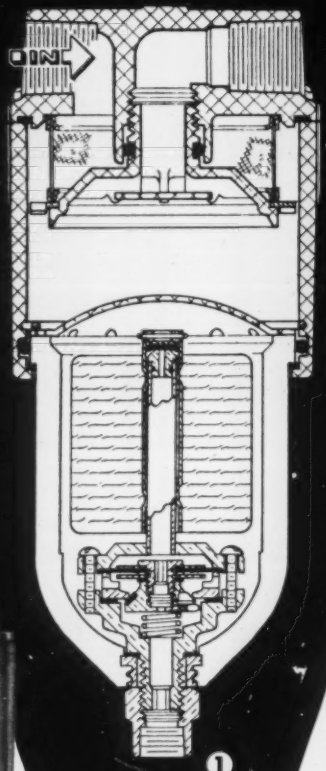


The revolutionary new Monarch Series 62 Preselector Dyna-Shift Lathe with the headstock that thinks. Just set it and forget it!

Monarch
TURNING MACHINES
ACCURACY • ECONOMY • LONG LIFE
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY • SIDNEY, OHIO

NEW Advanced design Norgren AUTOMATIC-DRAIN AIR LINE FILTERS



NOW—24 Models to choose from

- Transparent Bowls—¼", ⅜", ½", ¾", 1"
- Metal Bowls—¼", ⅜", ½"

1 MORE EFFICIENT WATER REMOVAL

2 WIDER OPERATING RANGE
5 psi to 250 psi, up to 200° F.

BETTER... MORE EFFICIENT FILTRATION OF COMPRESSED AIR

You Get These Important Advantages:

- **More Efficient Water Removal**
  Greatly increased water removal efficiency—even at air flows 143% higher than ever before.
- **Operates Over Wider Pressure Range**
  Top efficiency at as low as 5 psi for all models and as high as 250 psi for metal bowl type.
- **Operates Over Wider Temperature Range**
  New metal bowl models in ¼", ⅜" and ½" sizes extend temperature range to 200° F.
- **Withstand Rougher Usage**
  Metal bowl models are ideal for applications likely to get rough usage.
- **Simplified Drain Mechanism**
  More efficient operation. Fewer parts.
- **Eliminates Manual Draining**
  Collected liquid is drained automatically—cannot return to air line. Drain operates as long as pressure is on the system.
- **Choice of Three Filter Elements**
  74, 64 or 25 micron elements—interchangeable.

Wherever Air is Used in Industry

C. A. NORGREN CO.

3412 SOUTH ELATI STREET • ENGLEWOOD, COLORADO

For complete information, call your nearby Norgren representative listed in your telephone directory—

OR WRITE FACTORY FOR NEW NO. 800 CATALOG

NEW PRODUCTS and equipment

forgings, and sheet metal.

The grinder quickly and easily adjusts to vertical or horizontal operation. The platen (10 x 21 in.) can be reversed top for bottom and side for side.

Standard belt speed is 3800 sfpm. *Write*: Hammond Machinery Builders Inc., 1611 Douglas Ave., Kalamazoo, Mich. *Phone*: Fireside 5-7151

Towing Tractors

Two models of Paymover tractors have been introduced. T-50 has 5000 lb drawbar pull; T-60, 6000 lb.

The tractors have torque-converter drives and automatic transmissions. They have two-wheel

drives and are suited to industrial tractor-trailer operations.

Several kinds of coupler attachments are available. *Write*: Frank G. Hough Co., 876 Seventh Ave., Libertyville, Ill. *Phone*: 2-4000

Hard-Facing Alloy

No. 56 is a nickel-base alloy containing chromium borides. It provides protective hardness of 50 to 55 Rockwell C yet is machinable with carbide tools.

The material melts at about 1925° F and has a low coefficient of friction which is retained as wear occurs. *Write*: Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich. *Phone*: Twinbrook 3-3800

Welding Blowpipe

The Oxweld W-47 is a medium-pressure blowpipe that can weld metal 28 gage to 3 in. thick.

The unit handles any oxygen or acetylene flow from 2 to 300 cfh. Fuel gas heating heads are available for use with total gas flows as high as 1500 cfh.

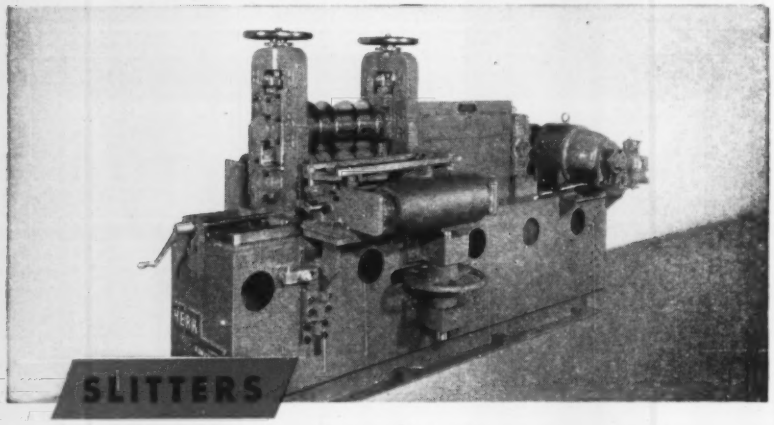
A cutting attachment equips the blowpipe for flame cutting on metal up to 8 in. thick.

Individual mixers in each weld-

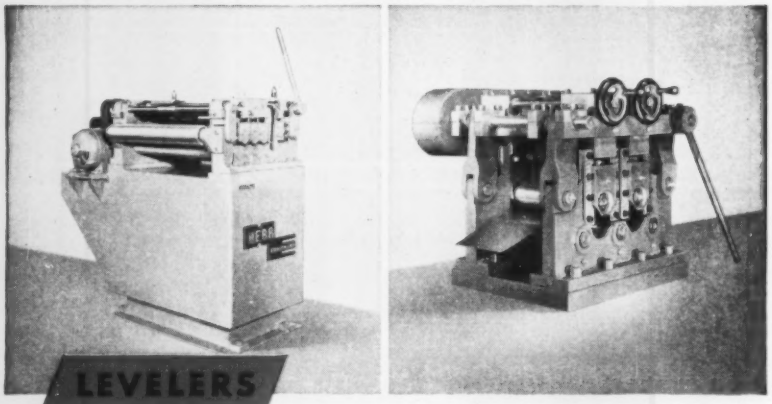
NEW!
miller
ARC-SPOT WELDING
Now equipped with a new and larger Onan 12.9 hp engine, the new Miller AEA-200-L produces a full 225 amperes of continuous rated, high cycle welding current or, 5 KW of 110/220 ac power for operation of power tools, lights, milking machines, etc., or, 1 KW of dc power.
Contractors, job weldors, farmers and many industries have shown a continuing high regard for the AEA's weatherproof ruggedness, easy portability and instant changeover versatility from ac welder to power plant to pipe thawer.
Readi-pull starter, rubber tire running gear and road trailer available as optional equipment.
Complete specifications sent on request.
". . . if it's Miller you know it's the finest . . ."
miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



Built to insure dependable, high precision slitting. All thicknesses from .001 to ⅛", any commercial width. Quick, extremely accurate knife set-up. Also complete high precision slitting lines including pay-off reel, leveler, slitter, scrap winder, scrap chopper and coiling reel.



2-High and 4-High types. Driven and pull-through designs with quick release, for handling an extremely wide range of materials, widths and gauges. Rolls can be rubber covered if desired for easier adjustment and handling high finished materials.

Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

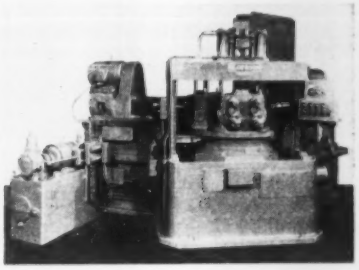
CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

NEW PRODUCTS and equipment

ing head make it possible to weld metal up to ¾ in. thick using only 5 lb of oxygen and acetylene pressure. *Write*: Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York, 17, N. Y. *Phone*: Murray Hill 6-5100

Boring Machine

This special unit does multiple operations on automotive body rear band parts.

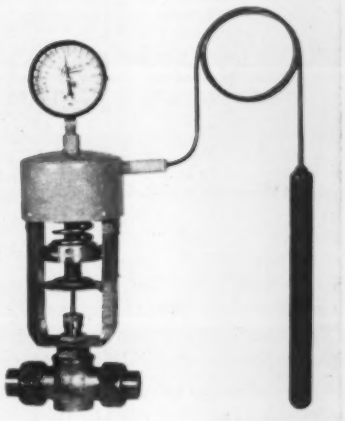


Two are machined at a time. Production: 220 pieces per hour. Finish bore tolerances are ±0.0005 in. *Write*: Olofsson Corp., 2738 Lyons Ave., Lansing, Mich. *Phone*: Ivanhoe 4-5381

Metal Finishing

This self-operated temperature regulator is used in plating, bonderizing, anodizing, cleaning, pickling, and rinsing solutions.

The temperature sensing bulb and connecting tube are coated



"Gadgeteering"

Kissin' Kin to

AUTOMATION

Webster defines our slang expression "a gadget" as "a device for doing something; especially, a part of machinery." It's kissin' kin to automation.

Many of the marvels in America's production lines are "gadgets" dreamed up by men tired of doing things the hard, slow way.

We manufacture air-powered work units to make the job of the methods engineer easier. With these integrally controlled power units he can eliminate many cams, gears, levers and mechanical linkages and perform an almost unlimited range of repetitive pull, push or lift motions, smoothly, economically, and in perfect synchronization with any related movement. With them he can convert existing machinery into faster, automatic units, or he can build in his own tool room low cost, highly efficient special purpose machines.

Like to know more?

These free four-color booklets will give you a quick picture of what Bellows "Controlled-Air-Power" work units can do for you. Ask for Bulletins BM-25 and ML-3. Address: Dept. **ST-956,** The Bellows Co., Akron 9, Ohio. In Canada, Bellows Pneumatic Devices of Canada, Ltd., Toronto, Ontario.

The Bellows Co.

AKRON 9, OHIO

MANUFACTURERS OF "CONTROLLED-AIR-POWER" DEVICES FOR FASTER, SAFER, BETTER PRODUCTION

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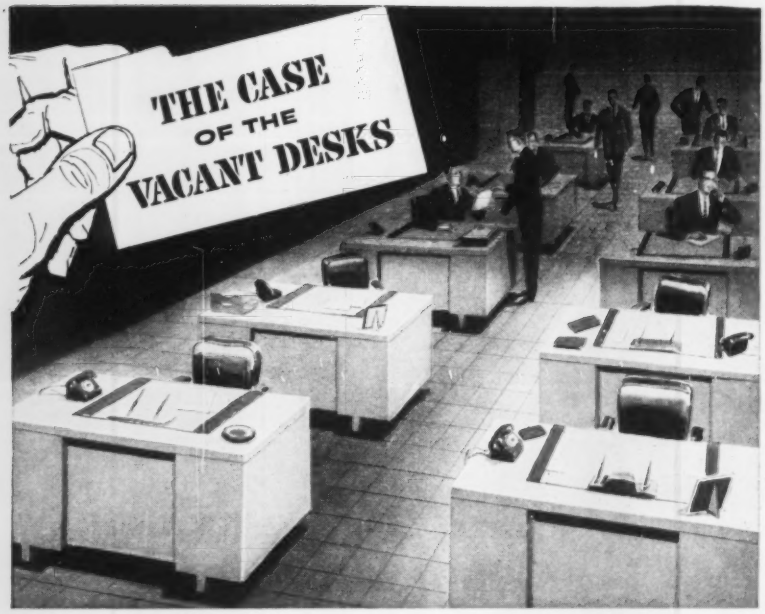


WHENEVER we see the desk of one of our Field Engineers vacant, it's a good sign. Chances are, he's on a trip, making calls with Foote Bros. Distributor personnel—helping solve a power transmission problem *in the field*. That's why we call them Field Engineers.

When a Foote Bros. Distributor has a customer or a prospect with a "tough" or unusual drive problem—one requiring the broad experience and knowledge of a power transmission specialist—he knows that a Foote Bros. Field Engineer will be available to help find the answer.

No product is successfully sold *unless* it is profitably used by the customer. This means recommending the correct type and size Foote Bros. gear drive for your specific requirements. That's why Foote Bros. believes its investment in the "vacant" desks of our Field Engineers is a good one—for us, and for you.

this trademark stands for the finest industrial gearing made

FOOTE BROS. Out-Rated LIFETIME GEARING

T. M. REG. U. S. PAT. OFF.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION

4583 South Western Boulevard Chicago 9, Illinois

with plastic. Stainless steel is used for the frame.

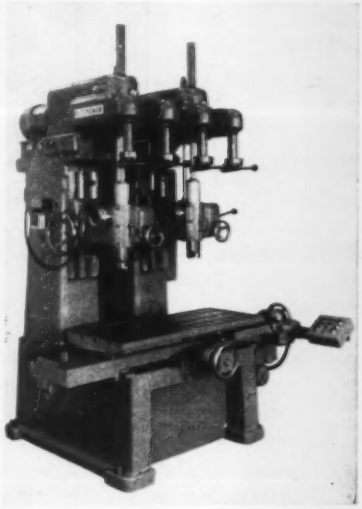
Model PA-2 is available in seven valve sizes from ¼ to 1½ in.

The regulator has a handwheel to adjust temperatures within a selected range. *Write*: Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Box 400, Knoxville, Tenn. *Phone*: 4-1641

Boring and Drilling

This machine has two fixed spindles mounted over a common table and carriage. The operator can bore two similar pieces at the same time.

The table moves in equal relationship to each spindle and the possibility of hole spacing errors is eliminated.



Using the spindles alternately gives accurate boring at wide hole spacing on a comparatively small machine.

The spindles are 26 in. between centers. The table is 20 x 51 in. and has a travel of 15 x 24 in. Maximum hole spacing is 50 in. *Write*: Cleereman Machine Tool Corp., 555 W. Washington Blvd., Chicago 6, Ill. *Phone*: Dearborn 2-5566

Flange Punch

The No. 7 detail punch needs only two passes to flange punch I-beams. In addition to speeding single-hole punching in small fabri-

39th National Metal Exposition

Thousands of products will be displayed by more than 500 metalworking firms in the vast exhibit areas of Chicago's International Amphitheatre and Exposition Hall, Monday through Friday, November 4 to 8. 50,000 experts from the United Statees and the free world will meet with you.

2nd World Metallurgical Congress

Years of intensive effort have gone into this world event. Overseas scientists and engineers will attend from 38 countries of the free world. They will exchange ideas with you, present their own technical and practical papers.

You will want to be in Chicago the week of November 4.

You will want to hear these scientists and engineers from the whole, wide wonderful world of metals . . . outstanding metal men from the United States, Canada and the entire free world . . . more than 38 countries will be represented. You will want to listen, to discuss, to meet the men who are creating this world of metals.

You will want to be in Chicago to see the vast array of metalworking products and equipment that will be displayed by more than 500 leading firms at the Metal Show — the 39th National Metal Exposition — in the International Amphitheatre and Exposition Hall. This will be the greatest display of metals and metalworking equipment. Here, in one week, you will see more products, talk with more metalworking experts, than in a year of travel.

Exhibit Space Available

Hundreds of manufacturers have reserved Metal Show space, but there are good locations still available in the vast new exposition halls of the International Amphitheatre. If the metalproducing or metalworking industries are your market, don't miss this show — write for display information now.

You will want to be in Chicago with your associates from management, engineering, production and sales.This will be a world event you will long remember — and from which you will obtain ideas and knowledge to meet the metalworking problems of today and tomorrow. Make a date now — to be in Chicago, the week of November 4. For hotel reservations write: Metal Show Housing Bureau, c/o Chicago Convention Bureau, Inc. 134 N. LaSalle Street, Suite 900, Chicago 2, Illinois.

Cooperating Societies: Metals Division, American Institute of Mining, Metallurgical and Petroleum Engineers . . . the Society for Non Destructive Testing . . . the Industrial Heating Equipment Association.

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The Engineering Society for the Metal Industry

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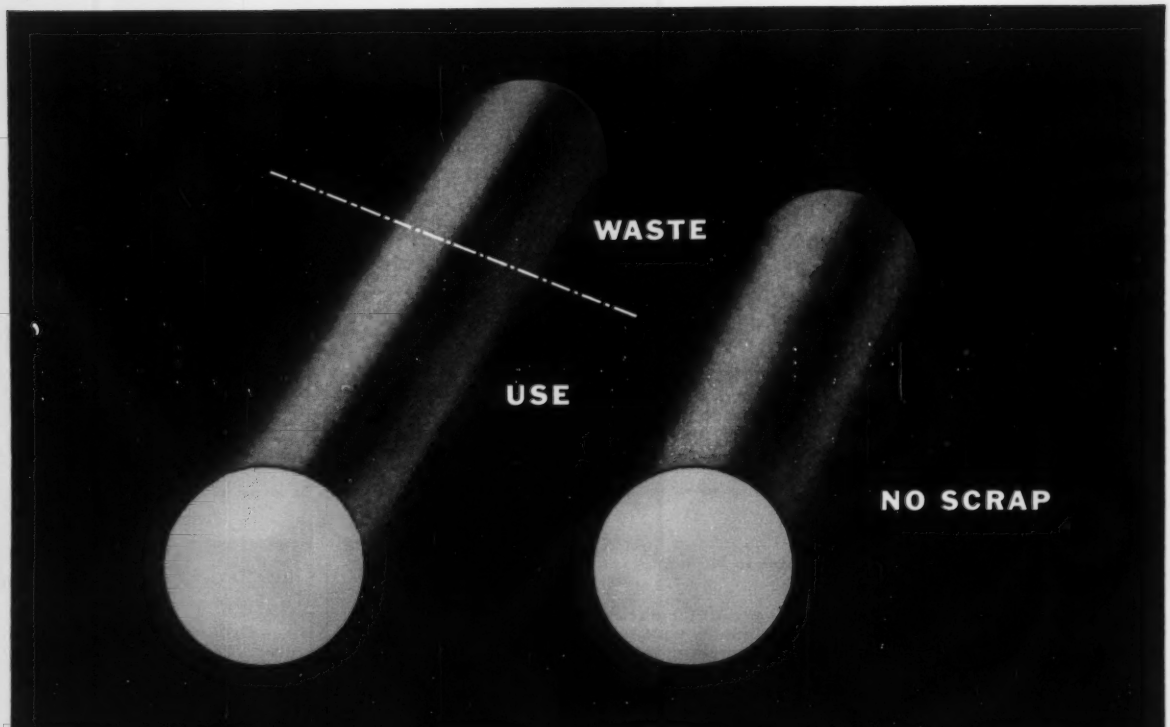


Want to save 7%...15%...up to 48%? Use Asarcon Bearing Bronze

When you buy standard 13-inch bronze bars, you have a "remnant" problem.

A one-inch remnant on a 13-inch bar, is a 7.6 per cent loss; a two-inch remnant is a 15.3 per cent loss; and, if you bought a 13-inch bar when you needed only 6¾-inches, your loss could run as high as 48 per cent.

When you buy Asarcon 773 Continous-Cast bearing bronze, however, you can get the *exact* lengths you need, all the way up to 105-inches. You save on short-end scrap; moreover, you'll find that you're saving on diameter losses and machining time as well. For, with Asarcon 773 you order the *diameters* you want, up to 9-inches. The clean-up allowance for the size you specify is in the piece you get, and is less than the common ¼ inch on rough-cut bars; and Continous-Cast cored bars save you costly machining time plus the weight of the core metal.

Asarcon 773 (SAE 660) is stocked—in 260 sizes, solids and tubes – by a national network of conveniently located distributors. Talk to one of them, or write directly to us. We'll be glad to show you how other companies are turning short-end scrap losses into savings.

ASARCO

Continuous-Cast Products Department

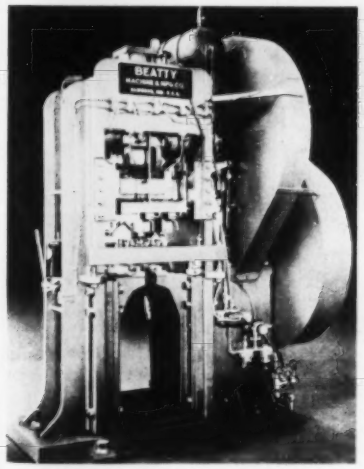
AMERICAN SMELTING AND REFINING COMPANY

Perth Amboy Plant, Barber, New Jersey • Whiting, Indiana

WEST COAST SALES AGENT: Kingwell Bros. Ltd., 457 Minna Street, San Francisco IN CANADA: Federated Metals Canada, Ltd., Toronto and Montreal

cating shops, the 100-ton punch eliminates the end-for-end turning of beams.

The punch handles beams from 6 to 36 in. long. It will punch a 1¼-in. diameter hole through 1-in. mild steel.



There are two overhanging bolsters with tools for punching holes in flanges on either side of the webs of the beams. *Write*: Beatty Machine & Mfg. Co., Hammond, Ind.

Slitters

These removable units are used in slitting and coiling lines. Both horizontal and vertical clearances can be checked and tested before the slitter is placed in the line.

Also used in slitting and other lines are coil driving and stripping units. They thread gages up to 0.500 in. thick and 75 in. wide and crop the strip end in 30 to 45 seconds. *Write*: Stamco Inc., New Bremen, Ohio.

Vacuum Furnace

This induction furnace, Model 2551-B, has a tilt pour capacity of 72 cu in. (12 lb of steel). Temperatures of 3100° F and higher are reached rapidly.

The pumping system maintains

Conco engineered Cranes rate tops with **plant engineers** — for application engineering that is outstanding, for the service of trained field representatives, for unmatched quality that assures minimum maintenance, reduced accidents, increased output. Conco engineers draw on over 37 years experience to design for the age of automation. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.

FROM ANY VIEWPOINT

A FINER CRANE

CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company 70-14th Ave., Mendota, Illinois

AFFILIATES: Conco Engineering Works–Domestic Heating Equipment • Conco Building Products Inc.,–Brick, Tile, Stone

a pressure of 1 micron.

The unit can be used for sintering, brazing, annealing, degassing, and heat treating, as well as melting and casting.

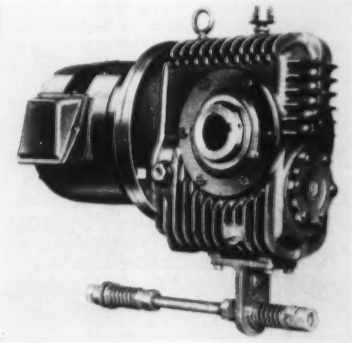
A coaxial feed through supplies power and water to the crucible coil assembly and makes it possible to change crucibles rapidly. *Write*: NRC Equipment Corp., 160 Charlement St., Newton Highlands 61, Mass. *Phone*: Decatur 2-5800

Gear Motors

High output torque ratings of this line of gear motors result from combining double enveloping worm gearing with a helical primary.

Hollow shaft mounting allows the shafts to be driven in any position with a floating power unit. The gear motor is tied down by a simple torque arm.

The line includes 1 to 15 hp, D-flange motors. Output speeds range from 7.3 to 525 rpm in 27 increments with 1750-rpm motors. *Write*: Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. *Phone*: Twinbrook 1-3111



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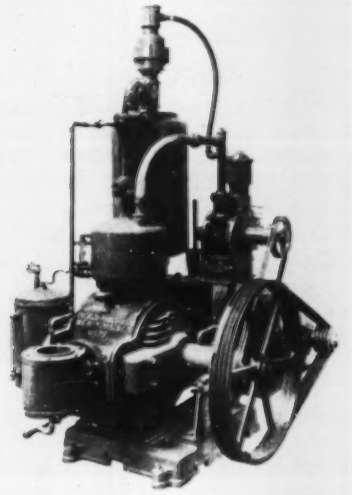
Vacuum Pumps

This line of combination two-stage pumps has capacities of 28 to 880 cfm for wet and dry systems.

The two-stage pump is made as an integral unit, consisting of a high vacuum stage and a fore or backer stage. It's powered by a single motor.



The high vacuum stage has its own lubrication supply, which is always under vacuum.

The pumps can remove condensable vapors and at the same time keep a high pumping efficiency. *Write*: Beach-Russ Co., 50 Church St., New York 7, N. Y. *Phone*: Cortland 7-1115

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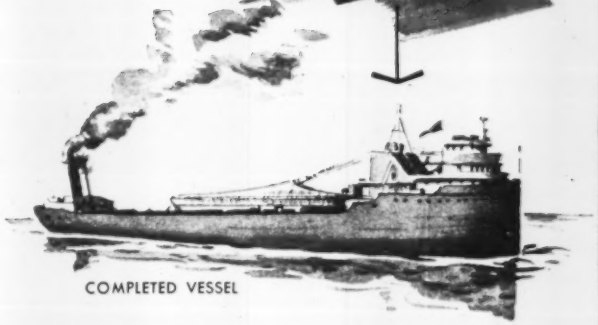
FOR ORE UNLOADERS

Steel Castings by:

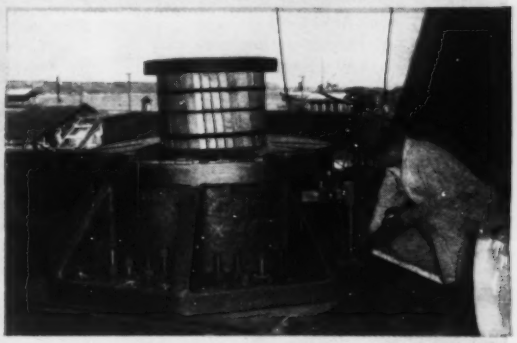
ERIE FORGE & STEEL CORPORATION

CAST STEEL TOP PIVOT TRIPOD.
WEIGHT 16,010 POUNDS.



COMPLETED VESSEL

CAST STEEL EYE BAR PIVOT. WEIGHT 8,830 POUNDS.



CAST STEEL BASE PIVOT. WEIGHT 25,660 POUNDS.

Typical of Erie Forge & Steel Corporation's versatility in making steel castings from raw material to finished product are these weighty ship's unloader components for ore carrier fleets plying the Great Lakes. Unloading iron ore cargoes is a rough job. The equipment to do it demands quality steel castings with the cast-in strength and "staying power" to handle the heavy ore with speed and utmost dependability. No ordinary steel casting will do the job. Quality control from raw material selection, to furnace, to mold and through machine shop, step by step, results in components which prove their high value every day in ore transportation from range to dock-side destination. You can be *sure* of steel castings, produced "Under One Responsibility and One Control", which will do a lot more than just "meet" your requirements when you deal with us. Your Erie Forge & Steel field man will be seeing you shortly.

* PHOTOS COURTESY OF CHRISTY CORPORATION, STURGEON BAY, WIS.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

NEW literature

Write directly to the company for a copy

Plastic Refractory

Bulletin 872, 4 pages, describes a slag resistant refractory with high strength and abrasion resistance for use in steel mills and foundries. Refractory Dept., Denver Fire Clay Co., 2301 Blake St., Denver 5, Colo.

Hydraulic Testing

A machine for testing hydraulic parts is described in bulletin HA-100, 4 pages. Test Equipment Div., Greer Hydraulics Inc., New York International Airport, Jamaica 30, N. Y.

Submersible Pump Cable

This 4-page bulletin describes sizes, conductors, strandings, insulations, diameters, and weights. Essex Wire Corp., 1601 Wall St., Ft. Wayne 6, Ind.

Motor-Generators

This 4-page bulletin, SK-4897, describes vertical high frequency units for induction heating. Star-Kimble Industrial Motor Div., Safety Industries Inc., P.O. Box 904, New Haven, Conn.

Tracing

Automatic duplication of parts machined on turret and automatic lathes is covered in this 12-page bulletin, No. 1171-AS. Gisholt Machine Co., Madison 10, Wis.

Marking Machines

Catalog 14, 72 pages, presents case histories of installations. Dept. S, Geo. T. Schmidt Inc., 4100 Ravenswood Ave., Chicago 13, Ill.

Drum Cleaning

An automatic blasting machine for cleaning 30 to 55 gallon drums is described in bulletin 220, 4 pages. Pangborn Corp., Hagerstown, Md.

Pelleting

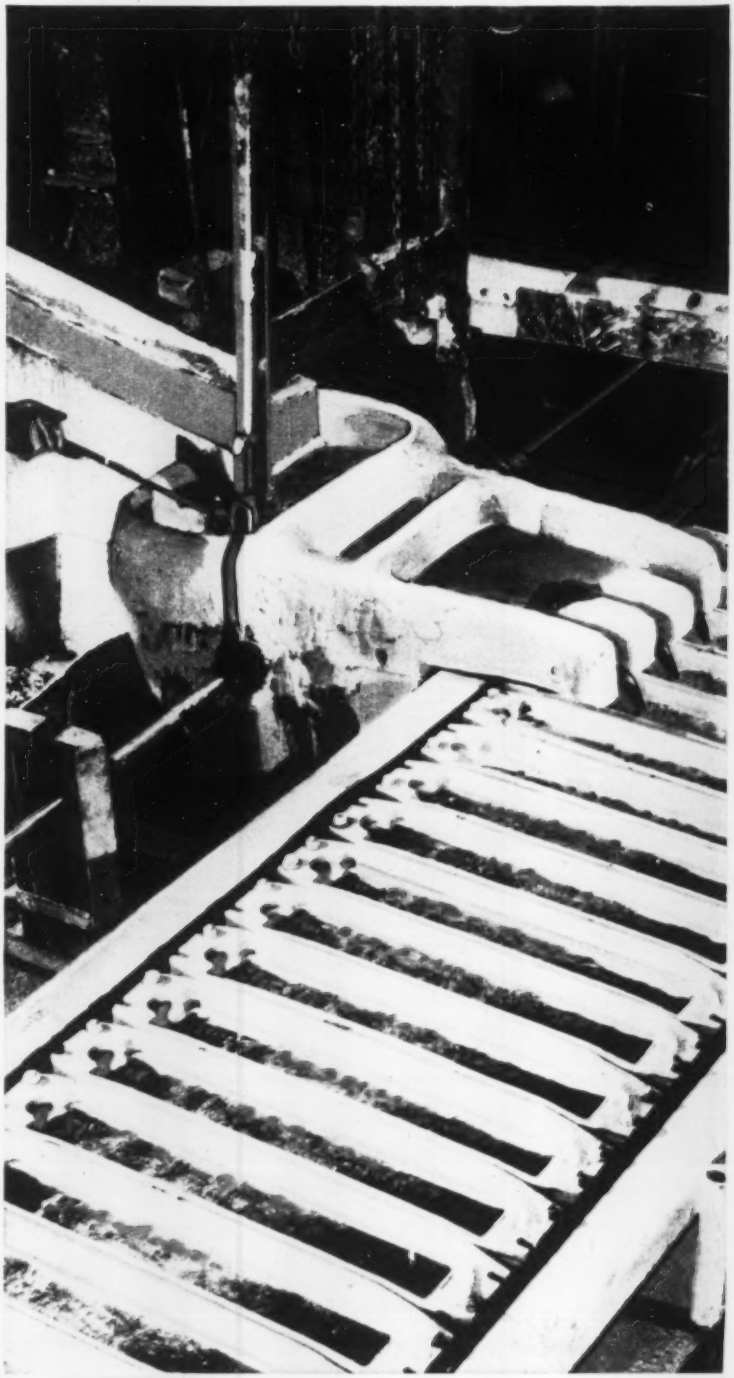
A pellet cooler and dryer for small and medium production is described in bulletin 177, 4 pages. Sprout-Waldron & Co. Inc., Muncy, Pa.

Blind Rivets

This 16-page bulletin describes rivets for aircraft use. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Automated Testing

Test stands and automatic tire handling equipment are covered in this



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Federated Aluminum Alloys always conform to published Performance Specifications

If you have had reason to doubt the performance capacity of certain aluminum alloys, it will pay you to consult Federated before you re-design or substitute another metal.

Often the performance requirements of a part indicate that a certain aluminum alloy will do the job; yet in operation, the part fails. Costly re-design or a more expensive metal are usually relied upon to rectify the trouble.

All aluminum alloys should provide the characteristics set for them in published specifications. At Federated's three aluminum plants, rigid quality control insures that production ingot adheres exactly to specified content. Impurities are held at or below the minimum allowable percentage.

Every heat of every Federated aluminum alloy is tested exhaustively. Refining, alloying and testing techniques are under strict quality-control procedures, developed by ASARCO's Central Research Laboratory, where scientists can control metal impurities to parts per million, if required.

A Federated field man will be around to see you soon. Spend some time with him. It will benefit you.

Federated Metals ASARCO

Division of

AMERICAN SMELTING AND REFINING COMPANY

120 Broadway • New York 5, N.Y.

In Canada: Federated Metals Canada, Ltd., Toronto and Montreal

NEW LITERATURE

6-page bulletin. Airway Products Inc., 4865 Highland Rd., Pontiac, Mich.

Grinding Wheel Selection

Bulletin 5, 2 pages, lists recommended grinding wheels for finishing overlays of hard-facing alloys. Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich.

Vacuum Valves

Bulletin V2, 32 pages, specifies over 250 (⅛ to 20 in.) valves. NRC Equipment Corp., 160 Charlemont St., Newton Highlands 61, Mass.

Control Valves

Hydraulic directional control valves for mobile equipment are described in bulletin 1552A20-26, Industrial Hydraulics Div., Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.

Automatic Roll Markers

Bulletin 900, 2 pages, describes tools for end face marking of screw machine parts. New Method Steel Stamps Inc., 149 Jos. Campau St., Detroit 7, Mich.

Bearing Catalog

AG-57, 88 pages, tells how to select ball thrust bearings, how to calculate thrust load capacities, and how parallelism and flatness affect thrust bearing performance. Also discussed: Fits and tolerances, formulas for calculating thrust loads for various gear drives, lubrication, and care of bearings. Ball bearing units, ball thrust bearings, washers and retainers, mounted radial bearing units, clutch release bearings, and roller bearings are covered. Aetna Ball & Roller Bearing Co., 4600 Schubert Ave., Chicago 30, Ill.

Nickel-Chromium Alloy

Metallurgical data and design information on an 80-20 nickel-chromium alloy used in high temperature heating are presented in bulletin M-57A, 20 pages. Hoskins Mfg. Co., 4445 Lawton Ave., Detroit 8, Mich.

Air Tools

Bulletin 12-101 describes a line of air powered screw drivers. Nut setters are covered in bulletin 16-301. Gardner-Denver Co., Quincy, Ill.

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Progressive is saving its customers up to 70% on special fasteners. Very likely we can save you thousands of dollars on many of your small metal components.

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You may have parts right now that our engineers could value analyze for you. Send us the prints. A Progressive quote is a sure indicator that you are buying right!

Machine screws and special fasteners are our business . . .
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Market Outlook

STEEL DEMAND and production are up slightly.

Not every product, though, is sharing in the order increase. Cold-rolled carbon sheets are the most favored in the upturn. This is largely because of the automobile industry's initial needs for 1958 models.

Also in stronger demand are hot-rolled carbon sheets, cold-finished carbon bars, and valve and other high carbon spring wire for autos.

DELIVERIES ARE PROMPT—Despite the upturn in ordering for these products, most producers can still make September deliveries on them.

Going the other direction are seamless and electricweld pipe, the needs for which are diminishing as oil companies retrench on domestic programs. Mechanical tubing is slow.

Demand for sheared plates continues in excess of supply. Plates are harder to get than standard structural shapes; wide flange beams remain a supply problem for some fabricators, principally bridge builders.

ROOM FOR ORDERS—The demand for galvanized sheets is still much below capacity. Grain oriented silicon sheets, the supply of which couldn't reach around the last 12 months, are now easier to get; demand is slightly below supply. Tin plate is showing the development of several slowing factors. Ordinarily, the fourth quarter is seasonally slower, but prior to that time, the need for tomato cans may be shrunk by the drought in the East.

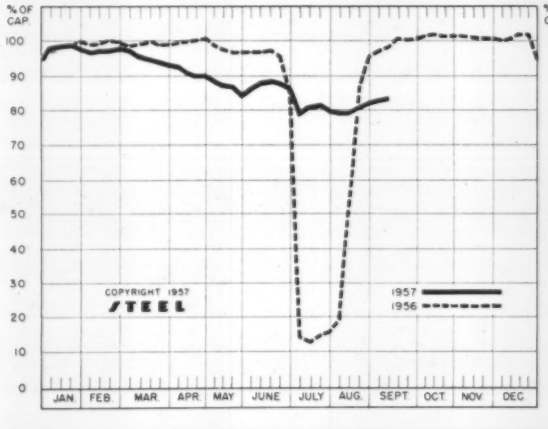
IMPLEMENT INDUSTRY HELPS—The auto industry is not alone in exerting increased demand for steel. The farm implement industry can be counted, too. It is operating at 15 to 20 per cent above year ago levels, with the prospect that this increased pace will continue. Agricultural implement demand has climbed up close to what it was in 1955.

OUTLOOK—Over-all demand for steel should rise the rest of this year. The vacation season is over, and plants should be using more steel than they did during the summer months. Even during the summer, many consumers were using more steel than they were buying. Eventually, they'll have to come back into the market for at least enough steel to match their consumption. Some consumers and products, though, will face seasonal restrictions. Reinforcing bars, for instance, probably will decline in demand as the winter season freezes out concrete construction in the northern sections of the country. While some steel products will go down in demand, others probably will go up.

OUTPUT UP—For four consecutive weeks, steel ingot production has risen. Edging up a half a point over the preceding week, output registered 83 per cent of capacity in the week ended Sept. 8. Production is 4.5 points above the year's low mark of 78.5 per cent recorded in the holiday week ended July 7.

SCRAP DECLINES—Scrap prices continue to run counter to steel production. They have been declining. For the third consecutive week, STEEL's price composite on steelmaking grades went down. The latest decline, 34 cents, lowered the composite to $51.83 a gross ton in the week ended Sept. 4.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

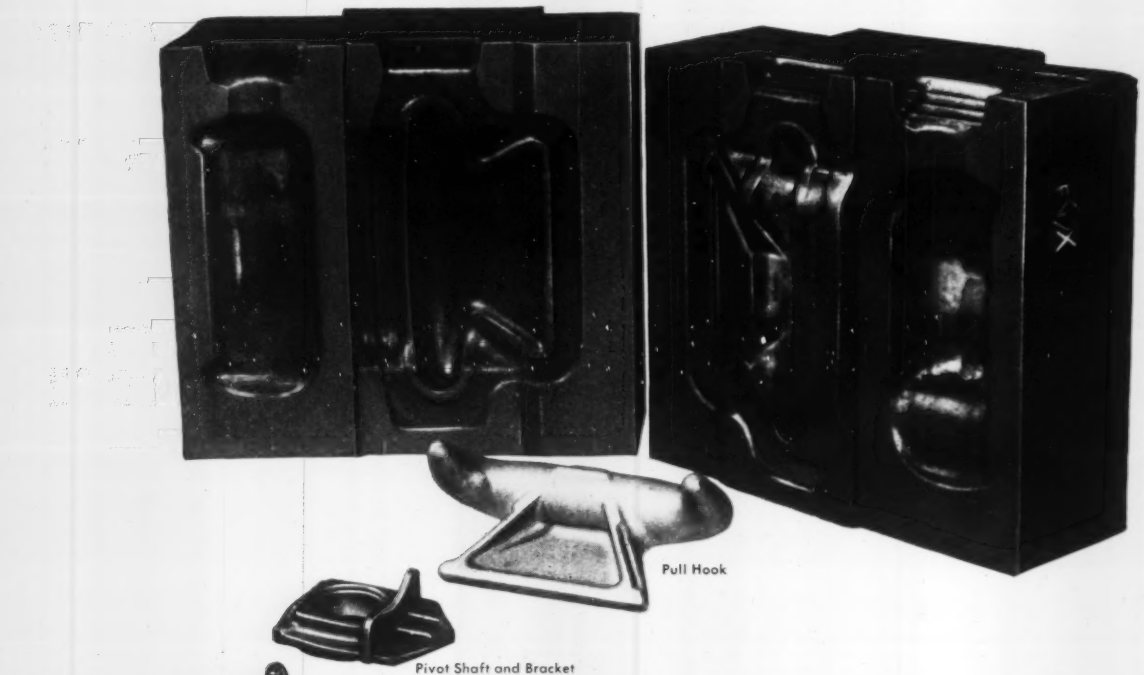
	Week Ended Sept. 8	Change	Same Week 1956	Same Week 1955
Pittsburgh	82.5	+ 1.5*	97	94
Chicago	85.0	0*	101	97.5
Mid-Atlantic	85.0	0	97	94
Youngstown	79.0	0	105	98
Wheeling	92.5	+ 1.5	98	93.5
Cleveland	82.0	— 3.0*	102.5	94.5
Buffalo	100.0	+ 5.0	107	105
Birmingham	85.0	— 0.5	96	93.5
New England	50.0	+ 1.0	90	81
Cincinnati	86.5	+ 2.5*	90	89
St. Louis	73.0	— 3.0	88	84.5
Detroit	93.0	+ 4.0	91	90.5
Western	96.0	— 2.0	94	103
National Rate	83.0	+ 0.5	98	93.5

INGOT PRODUCTION‡

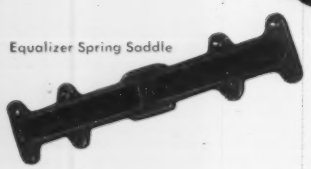
	Week Ended Sept. 8	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	131.7†	130.9	127.2	151.2
NET TONS (In thousands)	2,132†	2,103	2,043	2,429

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 57
Technical Outlook—p. 103



Equalizer Spring Saddle



USE FINKL DIE BLOCKS FOR QUALITY FORGINGS...

farm equipment manufacturers do!

Track Link

Draw Bar Bracket

International Harvester Company's Tractor Works, for one, uses Finkl die blocks to produce numerous tractor parts such as the pivot shaft bracket, pull hook, track link, equalizer spring saddle, and draw bar bracket shown on this page.

Because of the high volume production of these Crawler Tractor parts, Finkl FX die blocks are used at Harvester's Tractor Works to produce more forgings per sinking, and more sinkings per die. The special machining quality reduces die sinking time, without impairing the heat or wear resistance of the dies in production.

Finkl die blocks are available in several grades, all sizes, and tempers to handle virtually any forging requirement. Call your local Finkl representative next time you are considering die blocks or forgings. He will be glad to help you and there is no obligation.

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La Salle Steel and Republic Steel take the wraps off . . .

Something New in Cold Bars

LA SALLE Steel Co., Chicago, and Republic Steel Corp., Cleveland, have something new in cold worked steel bars that may help consumers in their continual battle against rising costs.

Copper in Steel—La Salle added 0.20 to 0.25 per cent copper to the analysis of its Stressproof steel bars and came up with a product which it claims increases machinability about 10 per cent. The company says it will machine faster than any other carbon or alloy steel at the same strength and of the same carbon content. Tests in customers' factories show 25 to 150 per cent longer tool life than was normal with Stressproof without copper. They also show production rate improvements of 15 to 50 per cent.

Copper controlled chemistry, as La Salle calls it, also takes advantage of some of the long known benefits of copper in steel. Resistance to atmospheric corrosion is improved substantially, although the company emphasizes that its product is not meant as a substitute for stainless steel if corrosive conditions are severe. Copper also improves the wearability and strength of steel. La Salle says it will continue to guarantee minimum yield strength of 100,000 psi in sizes through 2 in., and 90,000 psi in sizes from 2 to 3⅜ in. When drawn through a patented "T" die, Stressproof is said to limit warpage and cracking to a negligible degree.

Die-Form Process — Republic Steel's Bolt & Chain Div. has come up with a new method of cold reducing hot-rolled steel bars for the production of multidiameter machine shafts. The process, called Die-Form, is said to produce carbon, alloy, or stainless steel blanks so close to the finished shaft that a finishing cut or grinding is all that is required. Dies are pushed over the die form blank from opposite ends to the desired distance, then stripped off. The operation is repeated as often as required to reach the desired dimensions.

Republic claims savings in steel amount to one ton in every three over previous mass production methods. The shafts are used extensively in the automotive, farm equipment, and home appliance industries. In addition, the producer of the final part decreases his machining time and costs by decreasing the amount of material he has to remove. This cuts the cost of handling raw material and scrap. Republic claims that the process improves machinability of the bar.

The Die-Form process holds diameters to within 0.005 in.; lengths of the stepdowns to within 0.0625 in.; and straightness, in some cases, to 0.005 in. The process is economical only if orders are for 20,000 lb or more, the company says.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 174 & 175

Noticeable pickup in demand for hot and cold-rolled sheets is reported in virtually all the marketing centers. In the Midwest, producers say business is shaping up to about what had been expected originally, although it has been delayed a month. One area mill will operate its cold-rolled sheet facilities at capacity during September and October.

This mill has been turning down additional orders for September, and in another two weeks the same situation will apply to October.

Hot-rolled sheet orders are moving along well with cold rolled, and it now appears assured that fourth quarter sheet business will be good. So far the bulge in the Midwest is chiefly for automotive account, but it is figured that the tightening situation will prompt other users to order also, if for no other reason than to make sure their inventories are adequate for the next several months.

In the Cleveland district makers report automotive demand for cold-rolled sheets remains at the trickle which began last month. There are some faint signs that demand will broaden. Sales managers still anticipate substantial gains in October and rapid increases in November when 1958 model production gets into full swing. Strip demand in the area has not changed from its soft summer position.

With the exception of galvanized, New England users of flat-rolled specialties are placing fourth quarter orders in relatively better volume than they are for hot and cold-rolled sheets. While automotive parts suppliers are placing some carbon tonnage for October, volume is restricted in many cases due to uncertainty of eventual runs and 1958 model components contracts. Hot-rolled strip buying is light.

"Improving steadily without approaching full strength," is the way sheet sales managers in the Pittsburgh market describe the current outlook for automotive buying. Demand from the auto industry is expected to reach peak in October and remain at that level through

150,000,000 Standard Fastenings... Bolts, Nuts, Screws, Rivets, Washers ready for IMMEDIATE DELIVERY

Be Specific . . . Don't Compromise . . . get the exact corrosion-resistant fastenings you need—right away—from your nearby Harper Distributor. He stocks thousands and thousands of them to give you quick service. He's an expert in fastenings and will give your order specialized attention. Why shop? Why wait? He has what you need . . . on hand BEFORE you order. They're as near as your phone. Call your local Harper Distributor today for immediate delivery.

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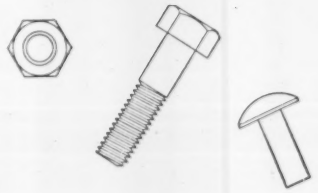
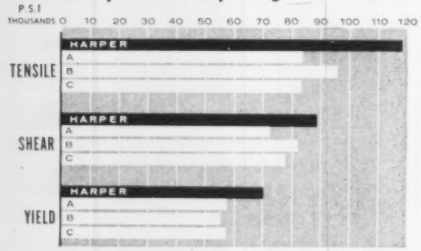
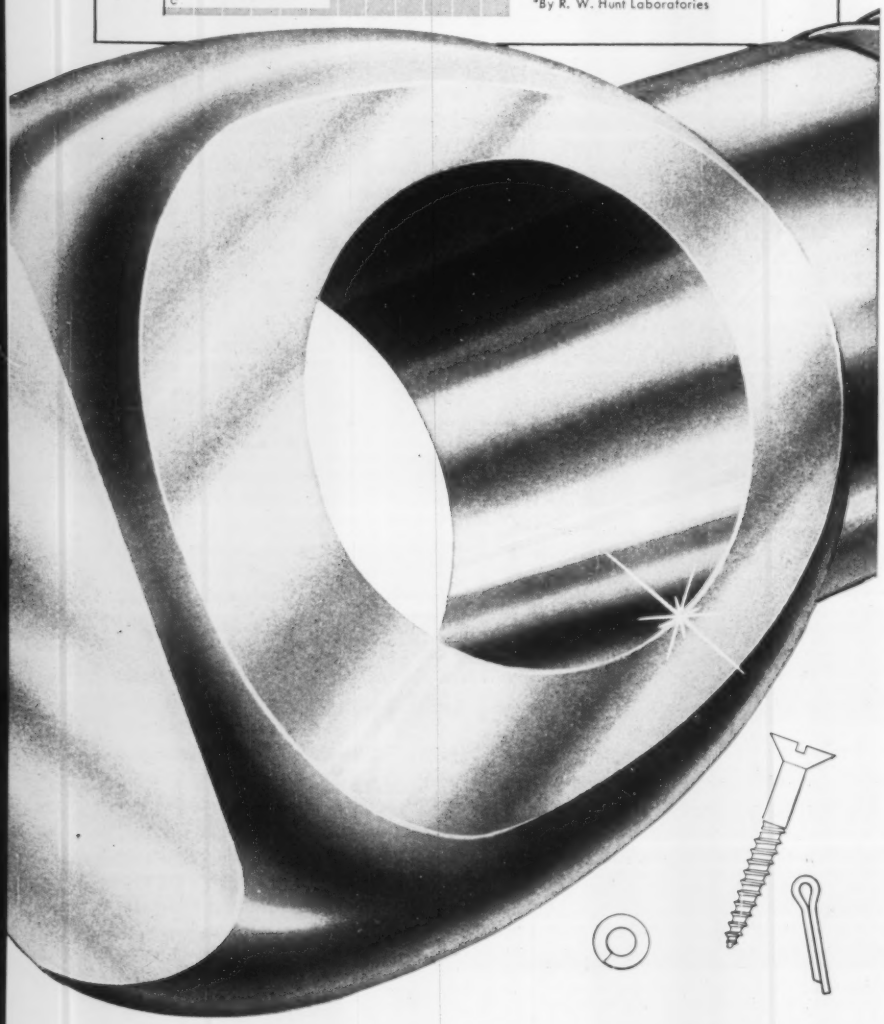


Irrefutable proof of Harper's greater metals' strength shown by laboratory test!



An important point in buying fastenings is strength. Independent laboratory tests*, utilizing Stainless Steel Machine Bolts by Harper and three other leading producers, prove Harper superiority in Tensile, Shear, and Yield Strength. The chart at left shows the actual results of these tests. For complete information on these important tests, request Form No. 126.

*By R. W. Hunt Laboratories



fourth quarter. More encouraging are scattered indications of improvements in appliance purchasing. Manufacturers have cut their sheet supplies and may now need to step up their ordering.

Strip producers see signs of gains in demand from the autobuilders, but their sales are still slow. These producers are continuing to accept orders for light plates, but they are becoming more cautious in their acceptances. Silicon sheet demand is below capacity to produce the product.

While demand for hot and cold-rolled sheets is improved in the East, September business will be somewhat below normal for the district. Hot sheets are moving better than cold rolled, and both are moving substantially better than galvanized sheets. There are few signs that October business will be much better than that in September.

Currently, manufacturers of metal furniture and door bucks and containers appear to be doing well. They are still fabricating more than they are buying, but purchases have been fairly good and on the upgrade. Business from the stove and switchbox manufacturers is off. Warehouses are specifying slowly.

Steel Bars . . .

Bar Prices, Page 173

The farm implement industry is operating 15 to 20 per cent better than it was a year ago, and prospects are good that the pace will continue. Agricultural implement demand is back close to the 1955 level. This improvement in implements is partly responsible for heavier output of hot-rolled carbon bars in recent weeks, and now a further boost in demand is coming from the automotive industry.

A slight increase in auto requirements is noted at Cleveland. Producers there think this indicates that inventories are nearly used up, and they expect sizable increase in October bookings. There still are few signs of a pickup in buying on the part of the appliances industry.

Hot-rolled barmakers at Pittsburgh report an upswing in sales, and cold-drawn producers also note a slight improvement. The pick-

up in cold drawn is attributed chiefly to buying by the screw machine industry.

Hot bar buying in the East still is handicapped by the lack of important specifications from fastener manufacturers, warehouses, and cold-finishers, all of whom continue to have substantial inventories. It is doubtful if September shipments in the area will be any heavier than those in August. To add to the gloom, some sellers doubt if October will be any better than September. Local buyers continue to consume more than they are ordering.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 173

Reinforcing steel is moving well, but demand is less pressing. Buying is expected to be off the next two quarters for seasonal reasons.

A Cleveland wiremaker reports increasing sales of paving fabric to the building industry.

Mill backlogs in the Pacific Northwest are shrinking, but there is still sufficient business on books to carry operations well toward the end of the year. Highway and general construction is still active, but new business is less than production. Recent placements in the area have been in small lots.

Plates . . .

Plate Prices, Page 173

Demand for sheared plates continues in excess of supply and will probably remain so over the remainder of the year. Pressure continues strong for line pipe, public utility work, and ships. Oil and chemical requirements are being well maintained.

Steel fabricators are requiring less plate, and car builders (helped over recent months with strip-plate) are not pushing for tonnage like they were. Unless there is an unforeseen spurt in freight car orders, car builders will be in comfortable position on steel over the remainder of the year. Schedules with the mills appear adequate and in some cases may be more than adequate as time goes on.

Eventually supply and demand for plates will come in fair balance—maybe early next year. Increased production at Sparrows Point should be a factor by that time. Expansion and moderniza-

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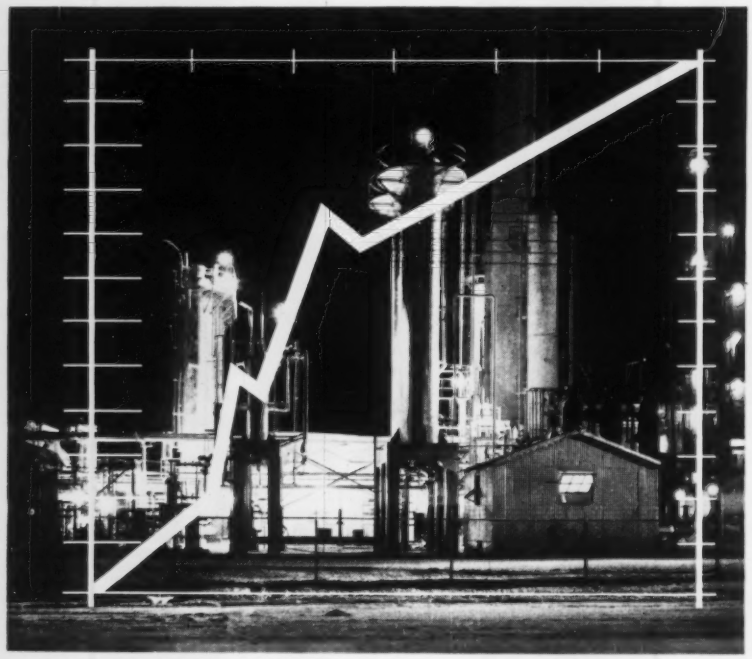
tion underway at Homestead, Pa., will also be felt a little later; and after that, perhaps, the improvements at Gary, Ind. Expansion at Coatesville, Pa., may be reflected late in 1958.

Demand for heavy plates continues strong from eastern shipbuilding yards and from builders of barges in the Pittsburgh area. This demand shows no sign of slackening in four quarter. As a result, plate over 1 in. thick is expected to be in short supply, although not critically short, for the remainder of this year it is generally thought.

Strip mills continue to accept orders for light plates, although some strip producers expect to devote more production to strip in October.

Difficulties in production at a 160-in. plate mill in the Pittsburgh area have reportedly delayed delivery of some heavy plates as much as seven weeks. Some producers are cutting their acceptances of orders in the fourth quarter.



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13300 PURITAN AVENUE, DETROIT 27, MICHIGAN

UNIT-SUSPENDED WALLS AND ARCHES

Tin Plate . . .

Tin Plate Prices, Page 175

Effective Aug. 26, Inland Steel Co., Chicago, increased base prices on tin mill products for export: Electrolytic tin plate (25-lb coating) $9.60 per base box, and tin mill black plate, $8.72 per base box. The increase is $0.03, and prices include export freight prepaid to New Orleans.

Tin plate producers in the Pittsburgh area expect to operate at or near capacity through September. Their incoming orders for future shipment are not enough to insure peak production through the fourth quarter. Some makers think they will have idle capacity in October, due to seasonal conditions.

The drought has not curtailed tin plate requirements significantly, although several eastern areas report reductions in the tomato crop. This may trim demand for tin plate in that general area.

Tubular Goods . . .

Tubular Goods Prices, Page 177

Oil country tube producers are filling up fourth quarter order books by exerting more sales effort than has been necessary in previous quarters. They expect to sell all the tube they'll make in the period, with a firm foreign demand taking up the slack caused by lower domestic requirements.

Seamless specialty products are moving slowly, as is buttweld pipe. Producers of pressure tubing expect to sell more in September than in August, but the margin of improvement is slight. Demand from the construction industries is the firmest segment of this market. Mechanical tube demand continues low. Demand is dull from producers of roadbuilding equipment. With slow buying on the part of small fabricators, the warehouses' requirements are low.

Pig Iron . . .

Pig Iron Prices, Page 178

Shipments of merchant pig iron are expected to gain in the fourth quarter. Foundries supplying the steel mills with ingot molds and other equipment have operated at a slow pace during third quarter, cutting their iron needs. With

signs of improving steel production rates, pig iron suppliers expect improvement in ingot mold and mill equipment sales will be reflected in heavier iron demand.

There has been no improvement in purchases of merchant iron for September delivery in the East. Some gain may be made as the month advances, but sellers generally are disappointed in the outlook. Foundry operations are spotty at best, and prospects for an early gain lack promise. While consumer stocks of iron are low, purchases continue on a hand-to-mouth basis.

In the Midwest demand is expected to improve slightly this month, but spotty foundry operations keep total volume at a disappointing level. Of the 43 blast furnaces in the Chicago district, 35 were operating last week, Inland Steel relighting its No. 2 at Indiana Harbor. This stack had gone down for relining July 9. The company plans to take its No. 4 stack out of blast about midmonth for repairs.

Demand for merchant iron is not keeping pace with the demand for steel in the Buffalo market. Merchant buyers are not placing large orders, buying hand-to-mouth. Pig iron output in the district remains at 100 per cent of capacity.

Improved foundry activity in the Los Angeles area is being reflected in a stronger demand for cast iron scrap. Melters are more active than at any time since late spring.

Despite the sluggishness in the iron market, prices are strong. Recently, producers of blast furnace silvery pig iron raised their prices 75 cents a ton.

Warehouse . . .

Warehouse Prices, Page 178

Warehouses anticipate that September will prove to be a better sales month than was August, now that manufacturing plant vacations are over. Most distributors hold good inventories of all products except heavy plates and structurals, and they are not ordering beyond sales replacement.

Generally, the jobbers report improved demand for cold and hot-rolled sheets. The pickup in this area is expected to accelerate as the weeks pass. In other products, the demand outlook is favorable, though light plate sales have declined, and tin plate requirements are beginning to slip. Merchant pipe and galvanized sheet sales have been depressed of late. Bars are moving slowly.

West coast distributors report sales have not increased significantly, but August volume bettered July by about 5 per cent. Brisk activity is expected in the fourth quarter.

Wire . . .

Wire Prices, Pages 175 & 176

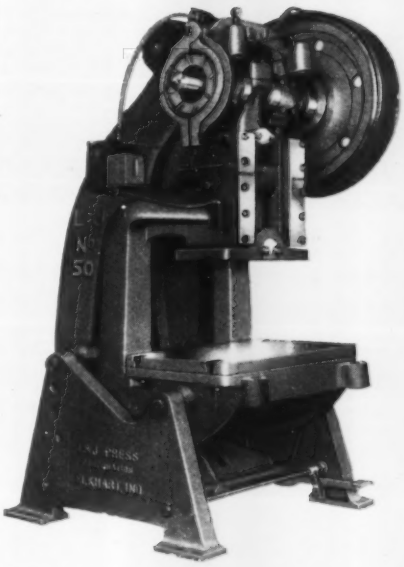
Valve and other high carbon spring wire orders from the automobile industry are slightly heavier. The bulk of specifications is for October and later shipment. New buying started somewhat later than expected, and the pressure for September delivery is light.

Volume placed by other large industrial consumers is slightly

(*Please turn to Page* 169)

L&J 50 SERIES

EXTRA CAPACITY WITH PRECISION TO MATCH



Large area dies are no problem when you have an L&J No. 50 Series press with its extra capacity. The exceptionally heavy frame provides maximum rigidity which enables the flanged, box-type ram to maintain precision alignment for precision jobs. The large work area will permit you to run a greater variety of work. Its dependability and tooling ease provide a new high in press efficiency.

Available in geared and non-geared models. Air clutch is available. It will pay you to get complete details now.

SPECIFICATIONS

Capacity: *Model 50*—50 tons, *Model 50B*—56 tons. **Shut Height:** 10" to 25". **Ram Stroke:** 3" to 8". **Ram Adjustment:** 3". **Ram Face:** 24" x 12". **Bolster Plate:** 36" x 24" x 2¼". **Throat Depth:** 12½". **Opening Thru Back:** 22". **Speed:** *Model 50* Non-geared—100 S.P.M., Geared—50 S.P.M. *Model 50B* Non-geared—95 S.P.M. Geared—46 S.P.M. *Higher speeds with air clutch.*

Write for Bulletin L-14

Describes L&J O.B.I. Presses. 23 Models, 14 to 90 tons, geared and non-geared. Also, 20 to 50 ton Double Crank, High Speed, Straight Side Presses.

L&J PRESS CORPORATION

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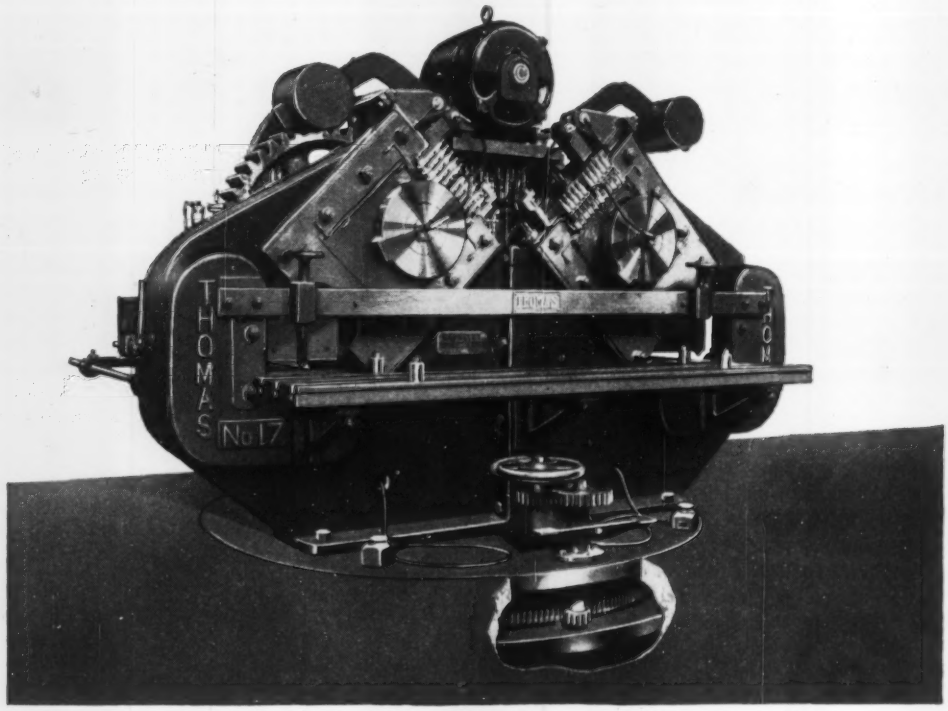
BUYING A DOUBLE ANGLE SHEAR?

If so, it's not the first cost that counts . . . but *the cost per cut*



Thomas Double Angle Shears, like all Thomas Metal-working Machines, are built on the basis of delivering the lowest cost per unit of work.

Thomas does not attempt to design Angle Shears to a price, but builds them to give dependable, fast, economical shearing performance. This assures you a minimum cost per cut and a rapid amortization of initial cost through increased production.

Write for Bulletin 315

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH 23, PA.

The trend is to THOMAS

70 . . . . . ***in Punches • Shears • Presses • Spacing Tables • Benders***

(*Continued from Page* 167)

heavier for the fourth quarter, but September schedules are not filled by a wide margin. Low mill backlogs assure prompt shipment on most medium and high carbon grades of wide.

A Cleveland wiremaker reports increasing sales to the building industry of paving fabric, rope, and electric wire. Merchant wire remains slow. The fastener industry is beginning to buy more rods.

Structural Shapes . . .

Structural Shape Prices, Page 173

Structural steel demand is off moderately. Bridgework remains the principal sustaining factor, although there are some scattered jobs of fair size in other directions, including 3000 tons of subway work for the New York Transit Authority, in Manhattan, on which bids recently went in.

Competition among fabricators continues sharp, with backlogs easing. Most of the medium and larger shops still have ten months or more work on hand. Wide flange beams remain scarce. Standard shapes are in somewhat easier supply, but tonnage is not seeking buyers.

Fabricating shops in New England are concerned only with wide flange sections so far as supply. For schools and most light industrial construction, few wide sections are required. The tight supply chiefly affects bridge builders. Slightly more bridge tonnage is coming out for estimates in New England.

Bookings by fabricating shops are more generally below shipments with more spot openings appearing in backlogs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3800 tons, material for aircraft shelters, Navy Air Force; projects in Washington, Oregon and Montana, to the Pacific Iron & Steel Corp., Los Angeles, at $1,143,774 by the Thirteenth Naval District.

2500 tons, 135 transmission towers near Metuchen, N. J., for the Public Service Electric & Gas Co., Newark, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

2800 tons, roadway and ramp viaducts, Founders bridge, Hartford-Springfield Expressway, Hartford, Conn., to the Harris Structural Steel Co., New York, through Savin Bros. Construction Co., Hartford, general contractor.

835 tons, power plant, Unit No. 2, Gas, Electric Light & Power Co., Tucson, Ariz., through Sanderson & Porter, New York, to Allison Steel Mfg. Co., Phoenix, Ariz.

600 tons, state highway bridge, FARC 57-134, Ulster County, New York, through Shanahan

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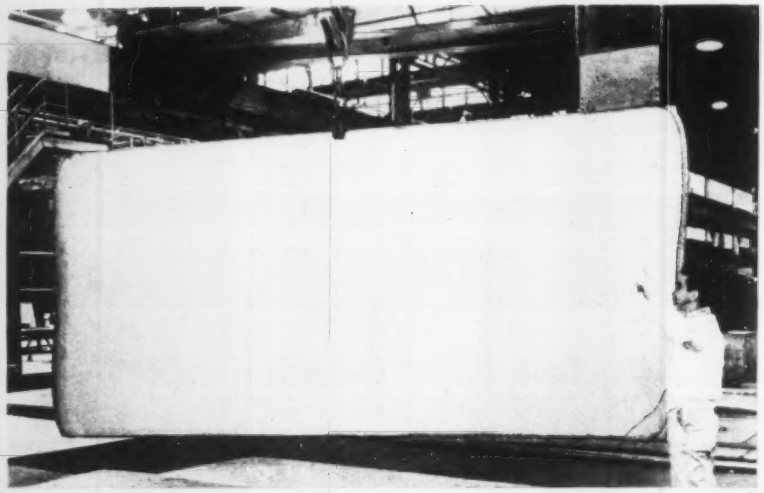

17-4 PH Stainless Now Made in Plate Form

Now you can get 17-4 PH stainless steel plates. This big one was produced by G. O. Carlson Inc., Thorndale, Pa. The 17-4 PH label is a trademark of Armco Steel Corp., Middletown, Ohio, and is one of two precipitation hardening grades available in plate form from Carlson. The other is Armco 17-7 PH. Production of this 3950-lb plate required a near constant temperature from pouring of the ingot through slabbing. It measures 174 x 79 x 1 in. Carlson says that 17-4 PH and 17-7 PH plates have the desirable mechanical properties of the hardenable chromium types and a workability and corrosion resistance approaching stainless types 302 and 304. For most uses, Carlson adds, these grades require only low temperature heat treating to produce Rockwell hardness of C40 to C50. Plates of this material are used in high strength applications, notably for guided missile and rocket components

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$6.78	$7.01	$6.76	$6.44
Merchant Bars (¼" Round incl. all extras)	7.62	7.85	7.48	7.22
Bands (1"x⅛"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	6.57	6.75	6.99	6.69
Beams & Channels (base)	6.82	7.00	7.24	6.94
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	103.00	104.00	....	....
Forged R Turn. Bars, C-1035 (from 10" dia.)	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, manganese steel plates and shapes, welded wire reinforcing mesh and hardware cloth, boiler tubes, A-335-P11 pressure pipe.

from prominent century-old West German Mills

Through Stahlunion-Export GmbH

BOCHUMER VEREIN World's first Steel Foundry, 1842—Vacuum degassed Forgings, Pinion wire and spring wire for watches and clocks.
DORTMUNDER UNION Originators of Interlock Sheet Piling—Larssen Sheet Piling, Plate, Shapes, Forged Bars and Shafts.
NIEDERRHEIN Europe's most modern Rod Mill—OH, CH, Low Metalloid, Specialty Wire Rod, Merchant Bars.
WESTFAELISCHE UNION Europe's largest Wire Mill—All types drawn Wire and Wire Products—Nails, Barbwire, Wire Rope, Prestress Concrete Wire and Strand.
PHOENIX RHEINROHR Europe's largest Pipe Mill—Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

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KURT ORBAN COMPANY, INC., 46 Exchange Place, Jersey City 2, N. J.
In Canada: Kurt Orban Canada, Ltd., Vancouver, Toronto, Montreal

Construction Co., general contractor, to Kelvin Corp., New York.

375 tons, three I-beam bridges, Concord, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Manchester Sand, Gravel & Cement Co., Manchester, N. H. general contractor.

218 tons, substation steel, to the Bethlehem Pacific Coast Steel Corp., Seattle, by the Bonneville Power Administration, Portland, Oreg.

200 tons, trusses for the Washington Square Park apartment, New York, through Paul Tishman General Contractor Inc., to Simon Holland & Son Inc., Brooklyn, N. Y.

STRUCTURAL STEEL PENDING

5850 tons, state bridge work, FISH 5716, Saratoga and Albany Counties, New York, D. A. Collins Engineering & Construction Co., Mechanicville, N. Y., low on general contract.

3000 tons, subway construction, New York Transit Authority, Route 112, Section 2, Manhattan, New York, Cayuga Foundation Corp., New York, low on general contract.

2600 tons, state bridge, York County, Pennsylvania, Lycoming Construction Co., Williamsport, Pa., low on general contract.

2000 tons or more, final stage construction Rocky Reach dam, Wenatchee, Wash.; general contract to the L. E. Dixon Co. and associates, in joint $52,413,076 venture.

1450 tons, state bridge work, LR 790, Section 1B, Lackawanna County, Pennsylvania, bids Sept. 27.

1090 tons, state bridge work, FARC 57-141, Saratoga and Washington Counties, New York, Arthur A. Johnson Corp. and Peter Kiewit & Son Contracting Co., New York, low on a joint bid.

640 tons, state bridge work, Erie County, Pennsylvania, bids Sept. 27.

625 tons, state bridge work, LR 797, Erie County, Pennsylvania, bids Sept. 27.

519 tons, state bridge work, LR 790, Section 1A, Lackawanna County, Pennsylvania, bids Sept. 27.

500 tons, state bridge work, Wayne and Pike Counties, Pennsylvania, Willis Paul & Proctor Co., Branchville, N. J., low on general contract.

465 tons, including 405 tons, medium angles, bids Sept. 12, general stores supply, Navy, Philadelphia.

385 tons, state bridge work, Fayette County, Pennsylvania, bids Sept. 27.

REINFORCING BARS . . .

REINFORCING BARS PLACED

295 tons, three state highway bridges, Concord, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Manchester Sand, Gravel & Cement Co., Manchester, N. H., general contractor.

225 tons, four dormitories, AFB, Dover, Del., to Taylor-Davis Corp., Wilmington, Del. Ivey Bros. Construction Co., Atlanta, general contractor.

150 tons, Washington state highway project, Whatcom County, to an unstated interest, Wilder Construction Co., Bellingham, Wash., is general contractor.

REINFORCING BARS PENDING

193 tons, Washington state highway projects, Whatcom County; general contract to the Wilder Construction Co., Bellingham, Wash., low at $426,988.

180 tons, state highway structure, Seymour, Conn.; bids Sept. 9, Hartford, Conn.

180 tons, foundations, Barnhart-Adirondack transmission line, Power Authority, State of New York.

RAILS, CARS . . .

LOCOMOTIVES PLACED

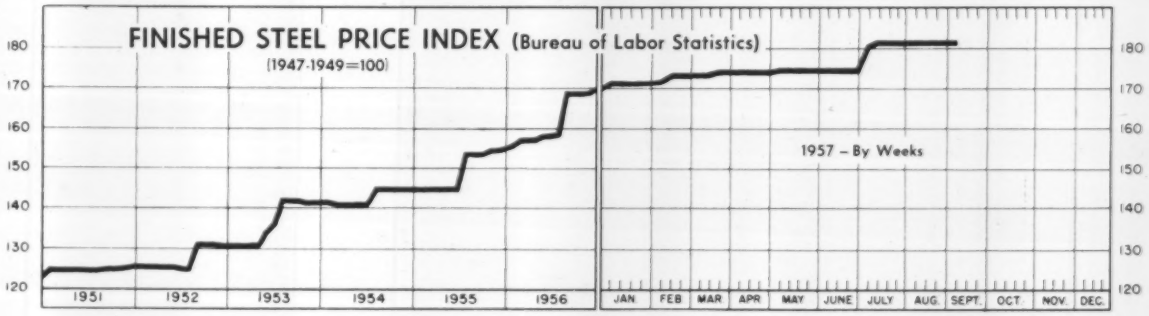
New York, New Haven & Hartford, 28, Two-in-One locomotives, to the Electro-Motive Div., General Motors Corp., La Grange, Ill.; the locomotives will be equipped to operate as standard diesel-electric engines or as electric engines with power supplied by overhead wire or a third rail.

RAILROAD CARS PENDING

Philadelphia Transit Co., 270 subway cars, bids asked.

Canadian National, two large depressed-center flatcars, to the Canadian Car Co., Montreal, Que.

Price Indexes and Composites



Sept. 3, 1957	Week Ago	Month Ago	Aug. Avg.	Year Ago
181.5	181.5	181.5	181.5	168.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 3

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	9.193
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 4 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.71	181.40
Index in cents per lb	6.479	6.479	6.479	6.114	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$146.19	$146.19	$146.19	$137.75	$111.66
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	52.54
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	52.16
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	53.27
Steelmaking Scrap, GT	51.83	52.17	53.83	58.83	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Aug. 28 Sept. 4	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.715	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.525	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.50	5.50	5.50	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.00
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-5.60
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	4.85-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.35	5.90-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.15	6.15	6.15	5.80	4.325

PIG IRON, Gross Ton	Sept. 4 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$53.00
Basic, Valley	66.00	66.00	66.00	62.50	52.00
Basic, deld., Phila.	70.01	70.01	69.88	66.26	56.75
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, deld., Phila.	70.51	70.51	70.38	66.76	57.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	48.88
No. 2 Fdry(Birm.)deld. Cin.	70.20	70.20	70.20	66.70	56.43
Malleable, Valley	66.50	66.50	66.50	63.00	52.50
Malleable, Chicago	66.50	66.50	66.50	63.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$53.50	$54.50	$55.50	$58.50	$44.00
No. 1 Heavy Melt, E. Pa.	51.00	51.00	52.00	59.00	41.50
No. 1 Heavy Melt, Chicago	51.00	51.00	54.00	59.00	42.50
No. 1 Heavy Melt, Valley	54.50	54.50	55.50	65.50	44.00
No. 1 Heavy Melt, Cleve.	51.50	51.50	52.50	63.00	43.00
No. 1 Heavy Melt, Buffalo	49.50	49.50	46.50	56.50	43.00
Rails, Rerolling, Chicago	67.50	71.50	79.50	84.50	52.50
No. 1 Cast, Chicago	44.50	45.50	47.50	53.50	50.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	17.50	17.00

"A challenge to all of us". . .

a statement by ***Robert B. Anderson,*** *Secretary of the Treasury:*

"The ownership by 40 million citizens of over 41 billion dollars in Series E and H Savings Bonds is a striking testimonial of confidence in America's bright future. It means security and opportunity for millions of families —a way to provide for children's education, the building of new homes, or more comfortable retirement.

"America benefits, too, from such widespread savings bonds ownership. This partnership of individual citizens in their government's fiscal operations means better management of the public debt—greater stability for our money—brighter prospects for the years ahead.

"Our country *needs* more savings—in all forms, including U.S. Savings Bonds—to help finance our growing economy; to pay for the plants and tools that mean more and better jobs for our ever-increasing population.

"Meeting this need is a challenge to all of us. Americans everywhere should be encouraged to regularly put aside part of their earnings for future needs. And certainly part of that saving belongs in the now better-than-ever U.S. Savings Bonds."

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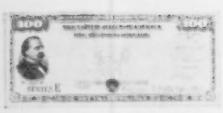

STEEL
The Metalworking Weekly

PUBLIC SERVICE ADVERTISING COUNCIL

Steel Prices

Mill prices as reported to STEEL, Sept. 4, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 174; to footnotes, page 176.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19 .101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 .101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2,U5,W14 ..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. N19..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3..121.00
Detroit S41 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 .114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14..114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ....117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 .....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ...6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 .....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.575
Ind.Harbor,Ind. I-2 ....5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14..5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 .....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 .....6.225
IndianaHarbor,Ind. I-2..5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(15) A10 ...5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 ....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1.5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....7.35
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Johnstown,Pa. B2 .....7.00
SparrowsPoint,Md. B2 ..7.00

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1..8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy
Aliquippa,Pa. J5 .....7.20
Claymont Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10...5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ...5.425
Alton Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ...5.425
Bridgeport,Conn.(9) N19 5 65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ...5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1.5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11.6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'e'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Youngstown(9) R2, U5..5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12,R2 9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
LosAngeles P2, S30
(Grade A) 11.30
(Grade B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ..7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. N19 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ..10 65
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ..8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 ..5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary, Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ...6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.56
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Pittsburgh J5, U8 ....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2..5.325
ChicagoHts.(4)(44) I-2..5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa. (3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(4) J8 . 5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda (4) B12 ....6.00
Williamsport,Pa. (3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10....4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless, Pa. U5 .....4.975
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
Granite City,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 ....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 .....8.175
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana, Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ...6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville, O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse, Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 .....10.275
Gary, Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna (37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	.....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	...6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	.7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ...6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ...6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O.(28) R2 .....7.425
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1)..9.25
Butler,Pa. A10 (type 2)..9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2,Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allengheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calmuet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymount Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer.Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashlnad,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.825
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	6.35
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles C1	9.20
NewBedford, Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y. (32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.25
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.55
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale, Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10.	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfied,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	...	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	..	16.60	17.60	19.20	19.70	20.20
Warren,O. R2	....	....	....	....	....	....

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)	
Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturing Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. MS	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffao W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt. Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
New Haven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7, J4, T6	9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.55
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. MS	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	....16.55
Monessen,Pa. P16	....16.55
Roebling,N.J. R5	.....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....11.65
Baltimore T6	.....11.95
Boston T6	.....11.95
Buffalo W12	.....11.65
Chicago W13	.....11.75
Cleveland A7	.....11.65
Crawfordsville,Ind. M8	.11.65
Dover,O. G6	.....11.65
Fostoria,O. S1	.....11.95
FranklinPark,Ill. T6	..11.75
Kokomo,Ind. C16	.....11.65
Massillon,O. R8	.....11.65
Milwaukee C23	.....11.85
Monessen,Pa. P7, P16	.11.65
Palmer,Mass. W12	....11.95
Pawtucket,R.I. N8	....11.95
Philadelphia P24	.....11.95
Riverdale,Ill. A1	.....11.75
Rome,N.Y. R6	.....11.65
Sharon,Pa. S3	.....11.65
Trenton,N.J. R5	.....11.95
Warren,O. B9	.....11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	Col.
AlabamaCity,Ala. R2	...173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Houston,Tex. S5	178
Fairfield,Ala. T2	173
Jacksonville,Fla.(20) M8	.184
Joliet,Ill. A7	173
Johnstown,Pa. B2	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$8.95

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	..$9.80
Wheeling,W.Va. W10	..9.80

POLISHED STAPLES	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	..177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	.186
Joliet,Ill. A7	175
Johnstown,Pa. B2	175
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2.	$10.26
Atlanta A11	.....10.36
Bartonville,Ill. K4	....10.36
Buffalo W12	.....9.82
Chicago W13	.....10.26
Crawfordsville,Ind. M8.	10.36
Donora,Pa. A7	.....10.26
Duluth A7	.....10.26
Fairfield,Ala. T2	.....10.26
Houston S5	.....10.51
Jacksonville,Fla. M8	..10.82
Johnstown,Pa. B2	.....10.26
Joliet,Ill. A7	.....10.26
KansasCity,Mo. S5	....10.51
Kokomo,Ind. C16	.....10.36
LosAngeles B3	.....11.05
Minnequa,Colo. C10	....10.51
Pittsburg,Calif. C11	....11.04
S.Chicago,Ill. R2	.....10.26
S.SanFrancisco C10	....11.04
SparrowsPt.,Md. B2	..10.36
Sterling,Ill.(37) N15	..10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	.$10.60
Atlanta A11	.....10.70
Bartonville,Ill. K4	....10.70
Buffalo W12	.....10.15
Chicago W13	.....10.60
Crawfordsville,Ind.	M8 10.70
Donora,Pa. A7	.....10.60
Duluth A7	.....10.60
Fairfield,Ala. T2	.....10.60
Houston S5	.....10.85
Jacksonville,Fla. M8	..11.16
Johnstown,Pa. B2	.....10.60
Joliet,Ill. A7	.....10.60
KansasCity,Mo. S5	....10.85
Kokomo,Ind. C16	.....10.70
LosAngeles B3	.....11.40
Minnequa,Colo. C10	..10.85
Pittsburg,Calif. C11	...11.40
S.Chicago,Ill. R2	.....10.60
S.SanFrancisco C10	...11.40
SparrowsPt.,Md. B2	...10.70
Sterling,Ill.(37) N15	..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	..$10.65
Atlanta A11	.....10.75
Bartonville,Ill. K4	.....10.75
Buffalo W12	.....10.20
Chicago W13	.....10.65
Crawfordsville,Ind.	M8 10.75
Donora,Pa. A7	.....10.65
Duluth A7	.....10.65
Fairfield,Ala. T2	.....10.65
Houston S5	.....10.90
Jacksonville,Fla. M8	..11.21
Johnstown,Pa. B2	.....10.65
Joliet,Ill. A7	.....10.65
KansasCity,Mo. S5	....10.90
Kokomo,Ind. C16	.....10.75
LosAngeles B3	.....11.45
Minnequa,Colo. C10	...10.90
Pittsburg,Calif. C11	...11.45
S.Chicago,Ill. R2	.....10.65
S.SanFrancisco C10	...11.45
SparrowsPt.,Md. B2	...10.75
Sterling,Ill.(37) N15	..10.75

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	..212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
Sterling,Ill.(7) N15	214
SparrowsPt.,Md. B2	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	.172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	..171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	..174

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston,Tex. S5	.....198**
Jacksonville,Fla. M8	...203
Johnstown,Pa. B2	.....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	..198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	..198**
Monessen,Pa. P7	.....196*
Pittsburg,Calif. C11	..213†
Rankin,Pa. A7	.....193†
S.Chicago,Ill. R2	.....193**
S.SanFrancisco C10	..213**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	....198§

WOVEN FENCE, 9-15 Ga.	Col.
Ala.City,Ala. R2	.....187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.....192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston,Tex. S5	.....192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	..190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	....192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	....192**
Pittsburg,Calif. C11	....210†
Rankin,Pa. A7	.....187†
S.Chicago,Ill. R2	.....187**
Sterling,Ill.(7) N15	....192§

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa.	J5.17.15	18.95
Bartonville	K4..17.25	19.05
Cleveland	A7 ...17.15	....
Crawf'dsville	M8 17.25	19.05
Fostoria,O.	S1 ..17.65	19.20†
Houston	S5 ....17.40	18.95**
Jacksonville	M8.17.50	19.30
Johnstown	B2 ..17.15	18.95§
Kan.City,Mo.	S5 17.40	....
Kokomo	C16 ...17.25	18.80†
Minnequa	C10..17.40	18.95**
P'lm'r,Mass.	W12 17.45	19.00†
Pitts.,Calif.	C11.17.50	19.05†
SparrowsPt.	B2.17.25	19.05§
Sterling(37)	N15.17.25	19.05§
Waukegan	A7 ..17.15	18.70†
Worcester	A7 ..17.45	....

WIRE, Merchant Quality (6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	.8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta (48) A11	.8.75 9.425*
Bartonville(48) K4	.8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	...8.65 9.20†
Duluth A7	.....8.65 9.20†
Fairfield T2	.....8.65 9.20†
Houston(48) S5	..8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48)	S5.8.90 9.45**
Kokomo C16	....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	...8.90 9.45**
Monessen P7(48)	..8.65 9.25*
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	...8.65 9.20**
S.SanFran. C10	9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	..8.90 9.575§
Sterling(1)(48)	..8.80 9.475§
Struth'rs,O.(48)Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)

½ 'n. and smaller:	
6 in. and shorter....	49.0
Longer than 6 in. ..	39.0
⅝ in. thru 1 in.:	
6 in. and shorter....	39.0
Longer than 6 in. ..	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter...	49.0

Carriage, Machine, Lag Bolts
Hot Galvanized:

½ in. and smaller:	
6 in. and shorter...	29.0
Longer than 6 in. ..	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter...	49.0
Longer than 6 in. ..	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in. ..	39.0
Blank Bolts	39.0
Step, Elevator, Tire Bolts	49.0

Stove Bolts, Slotted:

⅛ to ¼-in. incl..	
3 in. and shorter..	55.0
5/16 to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller..	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger..	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller..	46.5
⅞ in. to 1 in., incl..	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, Finished (Incl. Slotted and Castiliated):

1 in. and smaller..	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger ..	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller..	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger ..	53.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller..	40.0
¾, ⅞ and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller..	8.0
¾, ⅞ and 1 in. diam.	+6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller..	26.0
¾, ⅞ and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller..	+13.0
¾, ⅞ and 1 in. diam.	+32.0

Flat Head Capscrews:

¾ in. and smaller..	+76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:	
6 in. and shorter...	Net
Longer than 6 in...	+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25
1/16 in. under list less 19%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¾	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Huntington,W.Va. C15	....	....	....	6.50
Gary,Ind U5	5.525	5.425	....	...
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	...
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	.....6.60
Gary,Ind. U5	.....6.60
Ind.Harbor,Ind. I-2	....6.60
Lackawanna,N.Y. B2	...6.60
Minnequa,Colo. C10	....6.60
Seattle B3	.....6.75
Steelton,Pa. B2	.....6.60
Torrance,Calif. C11	....6.75

JOINT BARS

Bessemer,Pa. U5	....6.975
Fairfield,Ala. T2	....6.975
Ind.Harbor,Ind. I-2	...6.975
Joliet,Ill. U5	.....6.975
Lackawanna,N.Y. B2	..6.975
Minnequa,Colo. C10	...6.975
Steelton,Pa. B2	.....6.975

AXLES

Ind.Harbor,Ind. S13	...8.775
Johnstown,Pa. B2	....8.775

TRACK BOLTS, Untreated

Cleveland R2	.....14.75
KansasCity,Mo. S5	....14.75
Lebanon,Pa. B2	.....14.75
Minnequa,Colo. C10	...14.75
Pittsburgh P14	.....14.75
Seattle B3	.....15.25

SCREW SPIKES

Lebanon,Pa. B2	.....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	....9.75
Lebanon,Pa. B2	.....9.75
Minnequa,Colo. C10	...9.75
Pittsburgh J5	.....9.75
Seattle B3	.....10.25
S.Chicago,Ill. R2	.....9.75
Struthers,O. Y1	.....9.75
Youngstown R2	.....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022" 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 8.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Supply Co.; Kennmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc., Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base—Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.170
18.25	4.25	1	4.75	....	....	2.385
18	4	2	9	....	....	2.755
18	4	2	....	....	....	1.845
18	4	1	....	....	....	1.680
9	3.5	..	....	....	....	1.275
13.5	4	3	....	....	....	1.945
13.75	3.75	2	5	....	....	2.325
6.4	4.5	1.9	....	5	....	1.185
6	4	3	....	6	....	1.430
1.5	4	1	....	8.5	....	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	*78.00*
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	11.34 #	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	10.15	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.31	10.40	11.41	....	9.35	9.68	....	15.24	9.59	9.65	11.13
Buffalo	8.25	9.45	11.07	....	8.50	8.80	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.70	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	51.94	8.67	8.65	11.51 # †††	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	....	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.20	11.35‡‡	8.65	14.65	15.95	9.60	8.30	12.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.36	9.66	....	9.44	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed ‡‡over 4 in.; §§over 3 in.; #1 in. round C1018; †††item quantity.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 5000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 100)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Silica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	30.00

Tungsten Ore

Net ton, unit, before duty

Foreign wolframite, good commercial quality	13.75-14.25
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.35-$1.45 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, $1.35-$1.45; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.90-3.30
60-65%	3.30-3.60

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi River	9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron: .... Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500 lb drum, frght allowed Carlots	39.50
Ton lots	41.50
Antimony, 500 ton lots	32.00*
Brass, 5000-lb lots	32.00-39.70†
Bronze, 5000-lb lots	49.50-54.10†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh ...	70.00
Minus 200 mesh ...	75.00
Nickel, unannealed ...	$1.15
Nickel-Silver, 5000-lb lots	50.20-54.80†
Phosphor-Copper, 5000-lb lots	61.30
Copper (atomized) 5000-lb lots	41.80-50.30‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.02
Stainless Steel, 316	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 2000 mesh: 1000 lb and over ...	Dollars 3.75
Less than 1000 lb ..	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Ore within $4.85 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European counties)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	*$6.30*	*$6.25*	*$6.25*	*$6.50*
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	*8.35*	*8.30*	*8.30*	*8.60*
Sheets, H.R.	*8.25*	*8.20*	*8.20*	*8.50*
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82 lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton: $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%. Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%. Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23.25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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Downtrend in Scrap Continuing

Lack of mill buying interest in dealer offerings reflected in further decline of 34 cents to $51.83 in STEEL's composite on the prime steelmaking grade

Scrap Prices, Page 184

Chicago—The scrap market continues to run counter to projected rise in steelmaking operations the remainder of this year, and a few important grades have sold at $1 to $4 a ton below last purchases. Some observers are inclined to believe the recent skid in prices is merely an overdue correction of a market that went to unwarranted heights earlier this year rather than a harbinger of unfavorable steelmaking operations to come.

Philadelphia — Domestic scrap prices continue to ease with trading light. No. 2 heavy melting is holding at $45, delivered, No. 1 bundles and No. 1 busheling at $52, and No. 2 bundles at $41.50. Electric furnace bundles are quoted at $54-$55.

Pittsburgh—Prices of most industrial grades continue to weaken in the absence of sales. Large steel producers have cut buying during the past month. Although the most recent large mill purchase of No. 1 heavy melting scrap was at $56, brokers are reported paying $2 or $3 less. No. 1 factory bundles dropped $1.50 a ton on a recent purchase. Brokers think the market will snap back quickly when steel production rises during early fourth quarter.

New York — Brokers' buying prices are easier. No. 1 heavy melting and No. 1 bundles are $48-$49, No. 2 heavy melting $39-$40, and No. 2 bundles $36-$37. Machine shop turnings are lower at $22-$23, mixed borings and turnings $23-$24, short shoveling turnings $26-$27, and low phos structurals and plates $51-$52.

Buying prices of brokers on nickel bearing stainless scrap continue to slide under dull trading.

Detroit — Automotive lists were light as August closed. Dealers and brokers think the market may hold fairly steady through September and part of October. Little scrap is being generated in Detroit, and this is expected to strengthen the market.

Cleveland—The scrap market is weak here, reflecting lower prices paid for automotive tonnage at the end of last month. The auto lists sold here as much as $3 a ton lower; at Detroit they went at $7 under prices paid there at the end of July.

There is some buying in the Valley, but it is little more than a trickle. The mills are not interested in large buys, and there is no indication they anticipate any shortage of supplies despite lagging generation in the auto trade.

Cincinnati—Prices turned downward $3 a ton on the principal steelmaking grades last week. The decline reflects slow buying by

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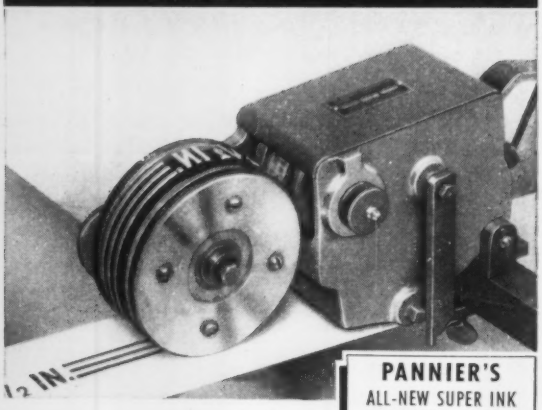

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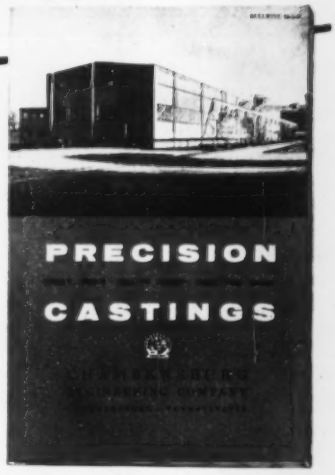

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area mills which entered the market for their September requirements this week. The fall in the scrap market was presaged by weak industrial list closings. No. 1 heavy melting is off $3 to $49-$50, brokers' buying price. Cast grades are down $1 a ton.

Boston—Steel scrap prices have softened, the decline being sharpest on borings and turnings following slow buying of that grade. No. 2 heavy melting and No. 2 bundles for domestic shipment are off nearly $2 a ton, and heavy melting steel is down $1. Prices paid for steel scrap delivered dock, Boston, are also lower, but range from $8 to $10 over domestic prices paid by brokers.

Buffalo—The local market shows signs of softening as dealers await the placement of new September delivery orders. Some sellers think prices will fall $2 a ton when mill commitments are made. The mills hold substantial reserves, and they have received shipments from upper lake points throughout the summer.

Birmingham—Widespread weakness appears to be developing in the local scrap market due to purchases $2-$3 a ton under recently prevailing prices on several steel grades. Open hearth buyers have entered the market at prices below their previous month's buy. Brokers report buying for open hearth and electric furnace plants is easier. Exporters are not actively buying. Export prices are as much as $4 a ton under the last purchases. The Alabama cast iron scrap market remains quiet. Movement is good, and there is no sign of any weakening in prices.

Los Angeles — Prices have increased sharply, most grades being up $2 to $6 a ton. No. 1 heavy melting is quoted at $50, No. 2 heavy melting $48, No. 1 bundles $49, and machine shop turnings $38. No. 1 cupola cast is up $2 a ton, being quoted at $55.

Seattle — The scrap market is unchanged at the levels established a week ago when prices went down $2 a ton. Large buyers are carrying sizable inventories, and they are not interested in new offerings. The export situation continues sluggish.

San Francisco—The steel scrap market here is weak. The trade is anticipating a price decline of $2 to $3 a ton on the key grades. Reduced consumption and fading export demand are causing the market softness.

Youngstown—Local dealers are concerned over failure of the large steel producers to begin buying scrap in anticipation of an expected upturn in steel operations. Scrap is piling up in the dealers' yards. Some No. 1 industrial material is moving on old orders.

Iron Ore . . .

Iron Ore Prices, Page 179

Shipments of Lake Superior iron ore in the week ended Sept. 2 totaled 2,836,127 gross tons, reports the American Iron Ore Association. This compares with 2,195,030 tons in the like week last year.

Shipments in the 1957 lake navigation season to Sept. 2 were 58,269,067 tons, up 15,947,110 compared with the 42,321,957 tons moved to Sept. 2 in the 1956 season.

Tool Steel . . .

Tool Steel Prices, Page 177

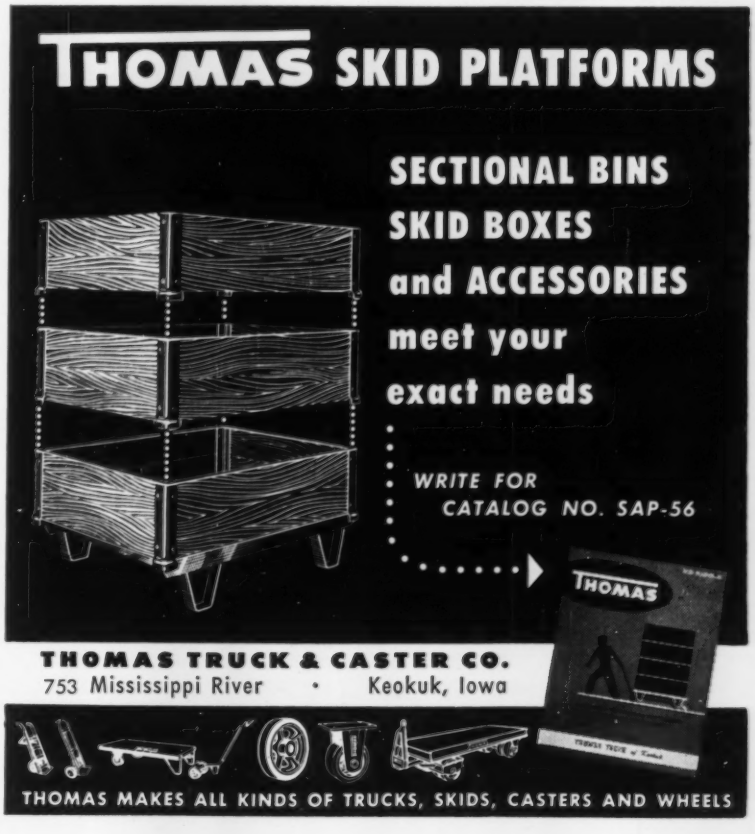
Shipments of high speed and tool steel (excluding hollow drill steel) totaled 6034 net tons in July, reports the American Iron & Steel Institute. This was down from the 7989 tons shipped in June. Data are not available for July a year ago when producing plants were closed by a strike.

Cumulative shipments in the first seven months this year amounted to 62,117 net tons.

Imported Steel Sluggish

Buying of imported steel is easier, with particular weakness appearing in the market on deformed bars, plates (basic bessemer), and hot-rolled sheets. Most of the major products are unchanged, although the undertone is softer.

Softening is ascribed to a lack of demand here and an easing in pressure on foreign mills from other directions.



Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Sept. 4, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 4	$51.83
Aug. 28	52.17
Aug. Avg	53.33
Sept. 1956	59.08
Sept. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*53.00-54.00*
No. 2 heavy melting	*45.00-46.00*
No. 1 factory bundles	*59.50-60.50*
No. 1 dealer bundles	*53.00-54.00*
No. 2 bundles	43.00-44.00
No. 1 busheling	*53.00-54.00*
Machine shop turnings	*31.00-32.00*
Mixed borings, turnings	*33.00-34.00*
Short shovel turnings	*33.00-34.00*
Cast iron borings	*33.00-34.00*
Cut structurals:	
2 ft and under	*61.00-62.00*
3 ft lengths	*60.00-61.00*
Heavy turnings	*47.00-48.00*
Punchings & plate scrap	*60.00-61.00*
Electric furnace bundles	*60.00-61.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*42.00-43.00*
Unstripped motor blocks	*31.00-32.00*
Clean auto cast	*49.00-50.00*
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*60.00-61.00*
Rails, 2 ft and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Angles, splice bars	*61.00-62.00*
Rails, rerolling	*67.00-68.00*

Stainless Steel Scrap

18-8 bundles & solids	*240.00-250.00*
18-8 turnings	*140.00-150.00*
430 bundles & Solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	51.00-52.00
No. 2 heavy melting	42.00-43.00
No. 1 factory bundles	56.00-57.00
No. 1 bundles	51.00-52.00
No. 2 bundles	*41.00-42.00*
No. 1 busheling	51.00-52.00
Machine shop turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Mixed borings, turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut foundry steel	*51.00-52.00*
Cut structurals, plates 2 ft and under	*58.00-59.00*
Low phos. punchings & plate	52.00-53.00
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	52.00-53.00

Cast Iron Grades

No. 1 cupola	51.00-52.00
Charging box cast	41.00-42.00
Heavy breakable cast	39.00-40.00
Stove plate	48.00-49.00
Unstripped motor blocks	35.00-36.00
Brake shoes	39.00-40.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	73.00-74.00
Rails, 18 in. and under	74.00-75.00
Rails, random lengths	66.00-67.00
Cast steel	64.00-65.00
Railroad specialties	66.00-67.00
Uncut tires	61.00-62.00
Angles, splice bars	66.00-67.00
Rails, rerolling	71.00-72.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*230.00-240.00*
18-8 turnings	*130.00-140.00*
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	54.00-55.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	54.00-55.00
No. 2 bundles	43.00-44.00
No. 1 busheling	54.00-55.00
Machine shop turnings	23.00-24.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	56.00-57.00
Electric furnace bundles	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	58.00-59.00

CHICAGO

No. 1 heavy melt., indus.	52.00-53.00
No. 1 hvy melt., dealer	49.00-50.00
No. 2 heavy melting	41.00-42.00
No. 1 factory bundles	55.00-56.00
No. 1 dealer bundles	50.00-51.00
No. 2 bundles	39.00-40.00
No. 1 busheling, indus.	52.00-53.00
No. 1 busheling, dealer	49.00-50.00
Machine shop turnings	*31.00-32.00*
Mixed borings, turnings	*33.00-34.00*
Short shovel turnings	*33.00-34.00*
Cast iron borings	*33.00-34.00*
Cut structurals, 3 ft	54.00-55.00
Punchings & plate scrap	55.00-56.00

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*42.00-43.00*
Unstripped motor blocks	*31.00-32.00*
Clean auto cast	*49.00-50.00*
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	54.00-55.00
R.R. malleable	58.00-59.00
Rails, 2 ft and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Angles, splice bars	*61.00-62.00*
Rails, rerolling	*67.00-68.00*

Stainless Steel Scrap

18-8 bundles & solids	*240.00-250.00*
18-8 turnings	*140.00-150.00*
430 bundles & solids	95.00-100.00
430 turnings	65.00-70.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	*39.00-41.00*
No. 1 bundles	*46.00-47.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	45.00-46.00
Machine shop turnings	25.00-26.00
Mixed borings, turnings	26.00-27.00
Short shovel turnings	27.00-28.00
Punchings & plate scrap	53.00-54.00

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	*44.00*
Stove plate	44.00
Heavy breakable	*43.00*
Unstripped motor blocks	*34.00*
Clean auto cast	52.00
Malleable	*55.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*47.00*
No. 2 heavy melting	*44.00*
No. 1 bundles	*47.00*
No. 2 bundles	*39.00*
No. 1 busheling	*47.00*
Machine shop turnings	*32.00*
Short shovel turnings	*34.00*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	*43.00*
Heavy breakable cast	*43.00*
Unstripped motor blocks	*43.00*
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt	57.00
Rails, 18 in. and under	*72.00*
Rails, random lengths	*65.00*
Rails, rerolling	*71.00*
Angles, splice bars	*59.00*

PHILADELPHIA

No. 1 heavy melting	51.00
No. 2 heavy melting	*45.00*
No. 1 bundles	*52.00*
No. 2 bundles	*41.50*
No. 1 busheling	*52.00*
Electric furnace bundles	*54.00-55.00*
Mixed borings, turnings	*35.00*
Short shovel turnings	*36.00-37.00*
Machine shop turnings	*32.00-34.00*
Heavy turnings	*40.00-47.00*
Structurals & plate	*56.00-57.00*
Couplers, springs, wheels	*66.00*
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable cast	53.00
Malleable	62.00
Drop broken machinery	*56.00-57.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*48.00-49.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*36.00-37.00*
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*23.00-24.00*
Short shovel turnings	*24.50-25.50*
Low phos. (structural & plate	*51.00-52.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	*225.00-235.00*
18-8 borings, turnings	*120.00-125.00*
430 sheets, clips, solids	*65.00-75.00*
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*39.50-40.50*
No. 2 heavy melting	*32.50-33.50*
No. 1 bundles	*39.50-40.50*
No. 2 bundles	*31.50-33.00*
No. 1 busheling	*39.50-40.50*
Machine shop turnings	*23.50-24.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	*24.50-25.50*
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	42.50-43.50
No. 1 bundles	49.00-50.00
No. 2 bundles	39.50-40.50
No. 1 busheling	49.00-50.00
Mixed borings, turnings	33.00-34.00
Machine shop turnings	31.00-32.00
Short shovel turnings	34.00-35.00
Cast iron borings	33.00-34.00
Low phos.	55.00-56.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	48.00-49.00
No. 1 machinery	53.00-54.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*43.00-44.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*49.00-50.00*
Machine shop turnings	*30.00-31.00*
Mixed borings, turnings	*26.00-27.00*
Short shovel turnings	*33.00-34.00*
Cast iron borings	*26.00-27.00*
Low phos. 18 in.	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Heavy breakable cast	*41.00-42.00*
Charging box cast	*41.00-42.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*53.00-54.00*
Rails, 18 in. and under	71.00-72.00
Rails, random lengths	64.00-65.00

BIRMINGHAM

No. 1 heavy melting	*47.00-48.00*
No. 2 heavy melting	*38.00-39.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*47.00-48.00*
Cast iron borings	*27.00-28.00*
Short shovel turnings	*39.00-40.00*
Machine shop turnings	*38.00-39.00*
Bar crops and plates	*50.00-57.00*
Structurals & plate	55.00-56.00
Electric furnace bundles	*48.00-49.00*
Electric furnace:	
3 ft and under	*46.00-47.00*
2 ft and under	49.00-50.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Unstripped motor blocks	44.00-45.00
Charging box cast	37.00-38.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	*52.00-53.00*
Rails, 18 in. and under	*68.00-69.00*
Rails, rerolling	*70.00-71.00*
Rails, random lengths	*60.00-61.00*
Angles, splice bars	*60.00-61.00*

SEATTLE

No. 1 heavy melting	42.00
No. 2 heavy melting	40.00
No. 1 bundles	40.00
No. 2 bundles	29.00
Machine shop turnings	27.00
Mixed borings, turnings	27.00
Electric furnace No. 1	48.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Unstripped motor blocks	30.50
Stove plate (f.o.b. plant)	28.00

LOS ANGELES

No. 1 heavy melting	*50.00*
No. 2 heavy melting	*48.00*
No. 1 bundles	*49.00*
No. 2 bundles	38.00
Machine shop turnings	*30.00*
Shoveling turnings	*36.00*
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	61.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*50.00*

SAN FRANCISCO

No. 1 heavy melting	47.00
No. 2 heavy melting	45.00
No. 1 bundles	46.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	32.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	43.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

No. 1 heavy melting	50.00
No. 2 heavy melting	45.00
No. 1 bundles	50.00
No. 2 bundles	39.00
Mixed steel scrap	47.00
Mixed borings, turnings	24.00
Busheling, new factory:	
Prepared	50.00
Unprepared	44.00
Short steel turnings	30.00
Rails, rerolling	61.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

A
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OF
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IRON & STEEL
SCRAP
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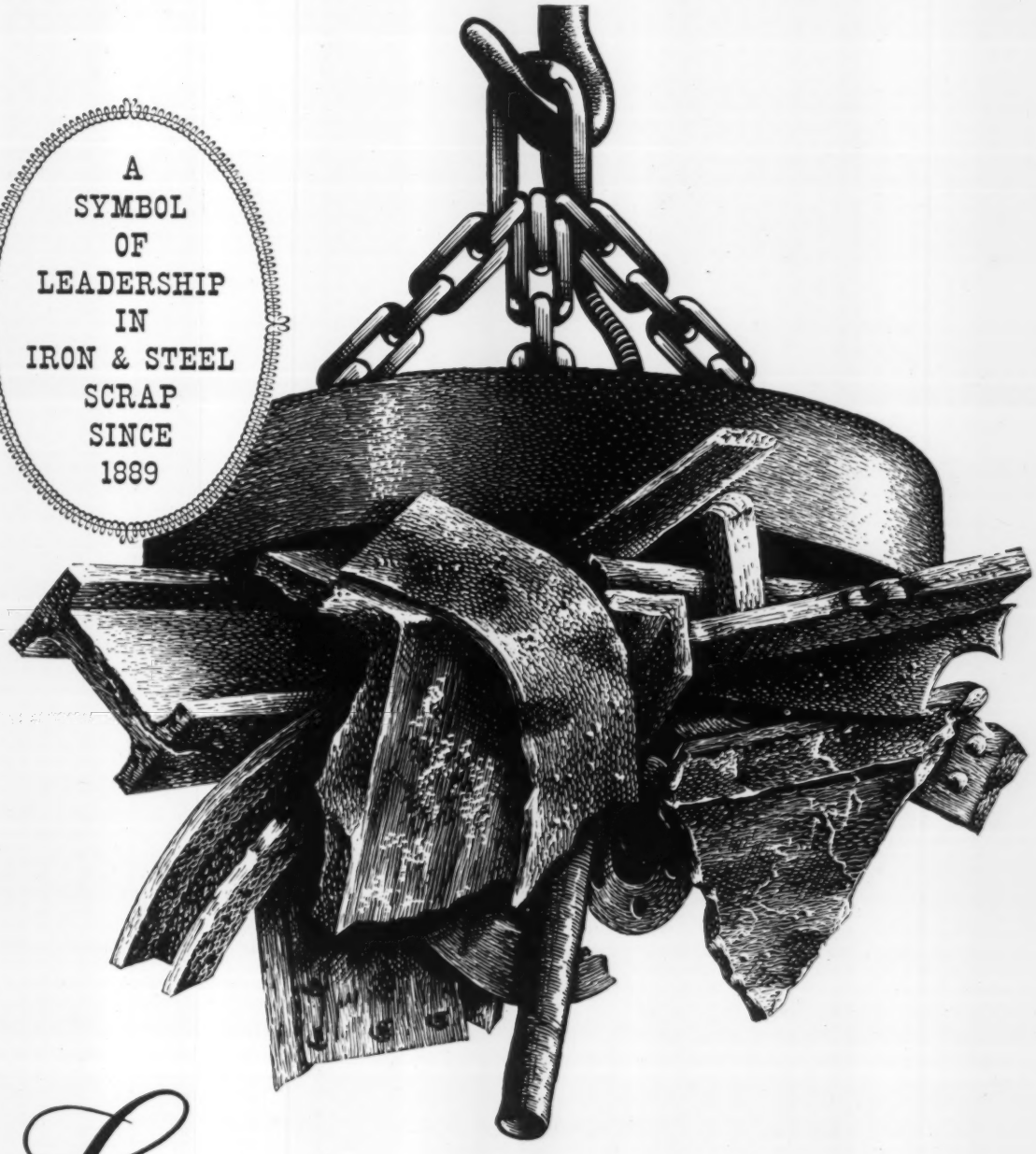
1889



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EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

Production May Hit Record

High metal output in 1957 is overshadowed by drop in consumption and rise in producers' stocks. Primary copper is down to 27 cents; custom smelted is 26.50 a pound

Nonferrous Metal Prices, Pages 188 & 189

IT'S POSSIBLE 1957 may go into the record books as the nonferrous industry's greatest production year. But producers view the pending "peak year" with anything but enthusiasm. For it may also be marked as the year of a sharp drop in demand and a buildup in producers' stocks.

Copper—There's real trouble here! Domestic refined production has been rising steadily: It was 1,467,448 tons in 1955, 1,580,387 tons in 1956. At the end of 1957's first half, it hit 846,730 tons, and went up another 127,434 tons in July.

Until this year, domestic consumption of refined copper was on the rise, too: 1,502,004 tons in 1955; 1,514,048 tons in 1956; but in the first half of 1957 consumption totaled only 710,280 tons, compared with 847,296 tons in the corresponding period last year.

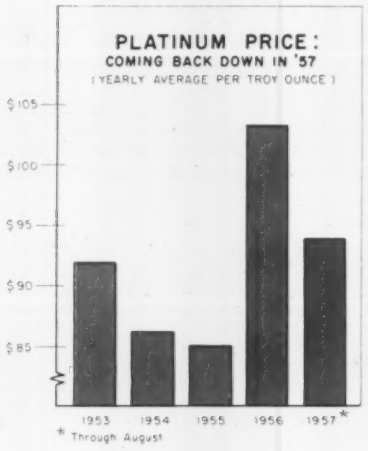
This is why producers' stocks are steadily climbing. They stood at 61,554 tons at the end of 1955; rose to 120,645 tons by December, 1956. This year, they moved to 165,549 tons in the first half and increased to 191,515 tons by Aug. 1.

Zinc—Domestic smelter output was 1,031,018 tons in 1955; 1,062,954 tons in 1956. At the end of the first half, output stood at 562,534 tons. It was upped to 648,278 tons by Aug. 1.

But consumption has dropped steadily. It fell from 1,007,619 tons in 1955 to 869,270 tons in 1956. For the first six months of 1957 it was 372,449 tons. It increased only 58,239 tons in July.

Stocks rose from 40,979 tons in 1955 to 68,622 tons at the end of 1956, then galloped to 133,455 tons during 1957's first half. They rose another 12,698 tons in July.

Lead — Although the lead market is far from firm, the situation here is not quite so serious as it is in copper and zinc. Total U. S. lead supply (includes primary, secondary, and imports) went up from 1,206,000 tons in 1955 to 1,308,305 tons in 1956. For the first five months of 1957, the figure hit 600,000 tons.



Domestic consumption through May was 482,200 tons. This compared with 1,190,000 tons for all of 1956 and 1,206,000 for 1955. It isn't likely 1957 will hit either of these figures.

Stocks continue to climb. They totaled 31,039 tons in December, 1955; rose to 41,182 tons in 1956; and hit 68,009 tons in July.

Aluminum—Primary production through July was just behind that of the corresponding period in 1956: 966,285 tons to 1,011,928 tons. But the year's total is expected to slightly exceed that of 1956.

There are no industry consumption figures, but producers admit consumption is off from last year's. Observers predict producers' stocks will climb to 300,000 tons by year-end.

Copper Dips to 27 Cents

Primary copper fell 1.5 cents to the 27.00 cents a pound level on Sept. 3, marking the fifth cut in quotations this year. As expected, the weakness both here and abroad could not sustain the 28.50 cent price.

Phelps Dodge Corp. was first to announce the cut on Sept. 3, followed by Kennecott Copper Corp. Anaconda Co. followed suit on Sept. 4.

Also on Sept. 3, leading custom smelters were quoting 26.50 cents a pound, down 0.50 from the previous price (27.00 cents). This is the fourth drop in custom smelted copper in the last few weeks.

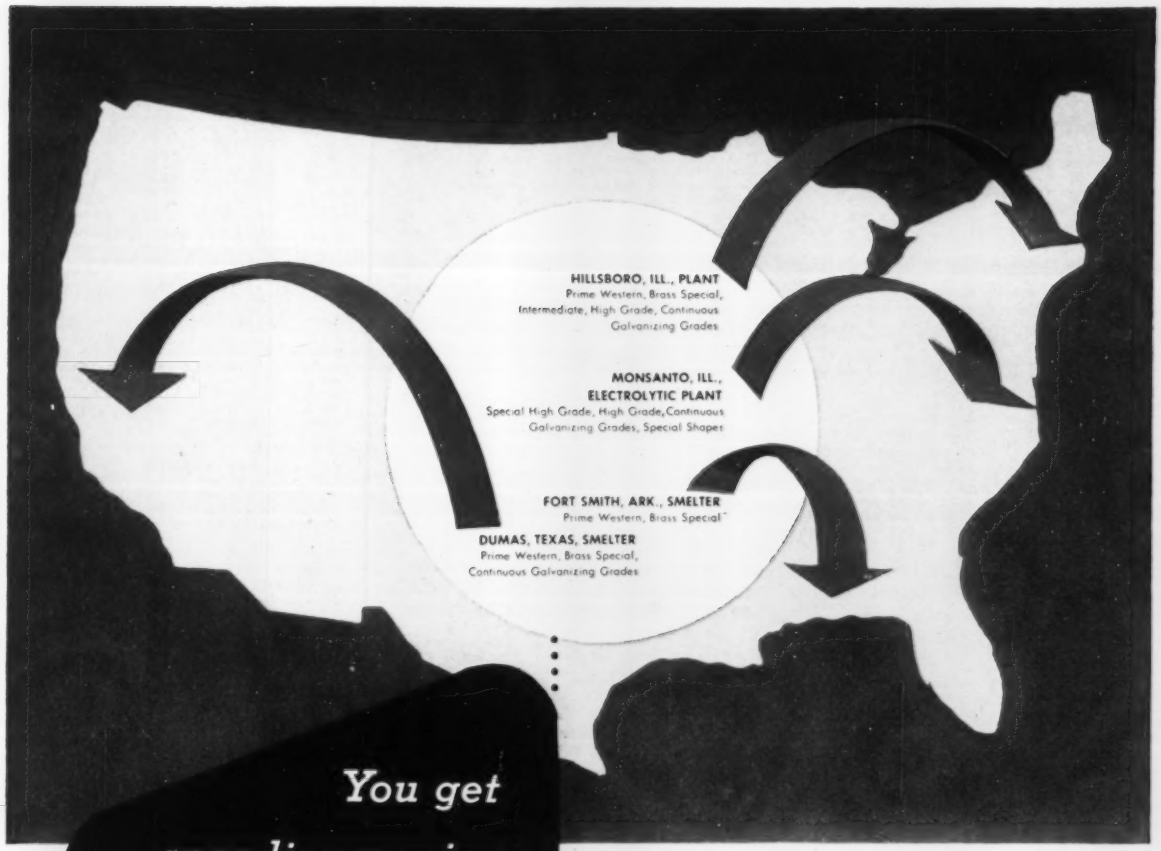
A world oversupply of copper complicated by light demand is responsible for copper's weakness both here and abroad. Yet, no major production curtailments have been announced.

Producers hope this latest cut will bring some stability to the market. But there's little optimism—many industry observers see no immediate end to the downward spiral.

NONFERROUS PRICE RECORD

	Price Sept. 4	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1956 Avg
Aluminum ..	28.10	Aug. 1, 1957	27.10	28.100	27.100	27.100
Copper	26.50-27.00	Sept. 4, 1957	26.50-28.50	28.639	28.822	39.500
Lead	13.80	June 11, 1957	14.80	13.800	13.800	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	93.00	Aug. 30, 1957	93.125	94.259	96.576	103.745
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 27.00 deld.; custom smelters, 26.50; lake, 27.00 deld.; fire refined, 26.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $250-252 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-22.50 per troy oz.

Platinum: $81-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55, per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 93.00; prompt, 92.875.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50.East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.25-30.25; No. 12 foundry alloy (No. 2 grade), 22.25-22.75; 5% silicon alloy, 0.60 Cu max., 25.50-26.00; 13 alloy, 0.60 Cu max., 25.50-26.00; 195 alloy, 25.25-26.75; 108 alloy, 22.75-23.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.00; grade 2, 22.25; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass, No. 115, 27.75; tin bronze, No. 225, 37.00; No. 245, 31.25; high-leaded tin bronze, No. 305, 31.75; No. 1 yellow, No. 405, 22.50; manganese bronze, No. 421, 25.50.

Magnesium Alloy Ingot: AZ63A, 40.75; AZ91B, 37.25; AZ91C, 40.75; AZ92A, 40.75.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.84, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.82, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 33.855; l.c.l., 34.48. Weatherproof, 30,000-lb lots, 35.16; l.c.l., 35.91. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6063-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.00-10.50; borings and turnings, 6.50-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	SCRAP ALLOWANCES f Clean Heavy	Rod Ends	Clean Turnings
Copper	50.63b	47.86c	....	50.82	24.500	24.500	23.750
Yellow Brass	44.02	32.23d	44.56	46.93	18.375	18.125	16.625
Low Brass, 80%	46.70	46.64	47.24	49.51	20.750	20.500	20.000
Red Brass, 85%	47.64	47.58	48.18	50.45	21.500	21.250	20.750
Com. Bronze, 90%	49.13	49.07	49.67	51.69	22.375	22.125	21.625
Manganese Bronze	51.89	46.06	56.52	....	17.250	17.000	16.500
Muntz Metal	46.29	42.10	....	....	17.250	17.000	16.500
Naval Brass	48.19	42.50	55.25	51.60	17.000	16.750	16.250
Silicon Bronze	55.20	54.39	55.24	57.21e	24.000	23.750	23.000
Nickel Silver, 10%	60.41	62.74g	62.74	....	24.625	24.375	12.313
Phos. Bronze, A-5%	69.61	70.11	70.11	71.29	25.375	25.125	24.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 19.50-20.50; No. 2 heavy copper and wire, 18.50-19.00; light copper, 16.50-17.00; No. 1 composition red brass, 18.00-18.50; No. 1 composition turnings, 17.50-18.00; yellow brass turnings, 10.25-10.75; new brass clippings, 16.50-17.00; light brass, 10.00-10.50; heavy yellow brass, 12.00-12.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 13.00-13.50; cocks and faucets, 14.00-14.50; brass pipe, 15.00-15.50.

Lead: Heavy 9.50-10.00; battery plates, 4.25-4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 40.00-45.00; old sheets, 40.00-45.00; turnings, 30.00-35.00; rods, 40.00-45.00.

Nickel: Sheets and clips, 65.00-70.00; rolled anodes, 65.00-70.00; turnings, 52.00-55.00; rods ends, 65.00-70.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.00-17.50; 3003 clippings, 17.00-17.50; 6151 clippings, 16.50-17.50; 5052 clippings, 16.50-17.00; 2014 clippings, 16.00-17.00; 2017 clippings, 16.00-17.00; 2024 clippings, 16.00-17.00; mixed clippings, 15.50-16.00; old sheets, 13.50-14.00; old cast, 13.50-14.00; clean old cable (free of steel), 16.50; borings and turnings, 14.00-15.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 22.00; No. 2 heavy copper and wire, 20.00; light copper, 17.75; refinery brass (60% copper) per dry copper content, 19.75.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 22.00; No. 2 heavy copper and wire, 20.00; light copper, 17.75; No. 1 composition borings, 19.00; No. 1 composition solids, 19.50; heavy yellow brass solids, 13.50; yellow brass turnings, 12.50; radiators, 14.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 45.29; oval, 43.50, 5000-10,000 lb; electrodeposited, 37.25, 2000-5000 lb lots; cast, 37.25, 5000-10,000 quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00 Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 74.80; 300-900 lb, 72.80.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 600-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 500 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 lb, 33.50; 30,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-600 lb, 65.80; 700-1900 lb, 63.00; 2000-9900 lb, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

PROCESS EQUIPMENT ENGINEER

To prepare process flow diagrams and equipment specifications for raw materials handling and iron and steel production facilities.

Some engineering experience required, preferably in a metallurgical industry. Operating experience desirable. Engineering degree required.

WRITE TO OR CALL
G. VICTOR HOPKINS
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2300 Chester Ave., Cleveland 1, Ohio
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STRUCTURAL STEEL SALES ENGINEER

One of the larger structural steel fabricating plants in Chicago has position open for engineer qualified to estimate and sell. Must have experience in pricing jobs. Man chosen can eventually take complete charge of this department. Should be under 40 years of age, college graduate. Some practical shop experience advisable.

Reply Box 587, STEEL
Penton Bldg. Cleveland 13, Ohio

WANTED

Superintendent for large ore crushing, screening and sintering operation in Great Lakes district. Should have heavy operating and maintenance experience. Salary open.

Reply Box 588, STEEL
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED

Positions Wanted

BROAD METALLURGICAL AND MECHANICAL sales experience in Ohio, Western Pa. and Western New York to mills, foundries and fabricators and OEM. Steel sales and application experience. Seeks sales position with greater potential. Age 32, degree, Cleveland resident. Reply Box 591, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14; all capitals, 25 words or less $4.50, each additional word .18; all capital leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

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OR

2. Build and operate complete job galvanizing facilities in your city.

OR

3. Engineer and install modern, low-cost facilities to replace outmoded galvanizing operations.

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Price $650.00

4—500 Amp. DITTO, 220/440 Volts
Price $500.00 Ea.

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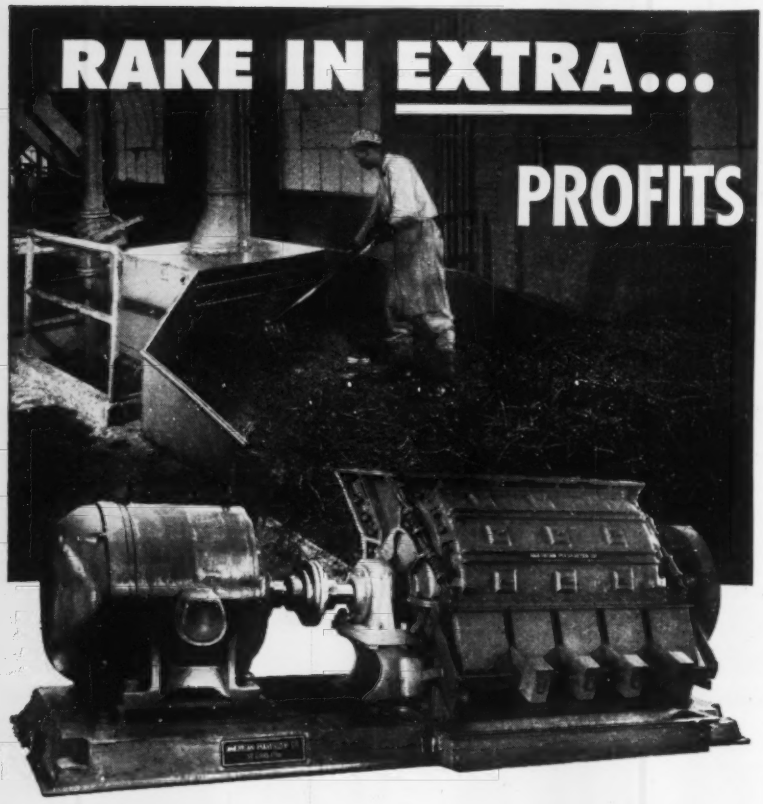
ROCKAWAY, N. J.



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Sept. 16

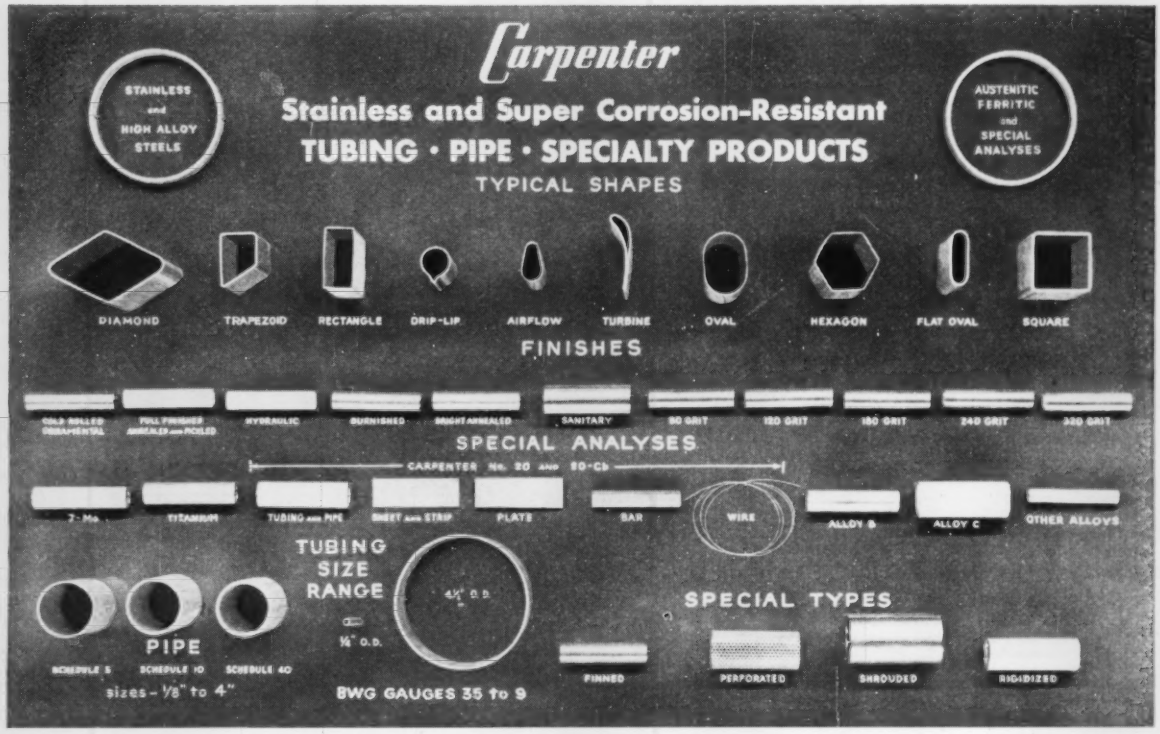
IN

STEEL

How Shall We Deal with Our Workers?

During the last two decades, management lost ground to the unions in dealing with employees. As the unions moved in, management tended to move back. The time is coming when management must recapture the leadership of its people.

For suggestions on how that can be done, see STEEL next week when it will publish the eighth in its ten-part series, Program for Management in 1957.



Experienced hands at solving many corrosion and heat problems

Your choice of over 35 analyses for
• corrosion resistance • heat resistance
• light-weight strength

AISI TYPES			SUPER CORROSION-RESISTANT TYPES
302	310	321	Carpenter Stainless No. 20Cb
304	316	347	Carpenter 7Mo
304L	316Cb	348	Carpenter Alloy B
309	316L	430	Carpenter Alloy C
309S	317	442	Titanium 55 and 70
309SCb	317L	443	

Other specialty grades in various stages of development are available: Zirconium, Zircalloy II, 19-9 DL, Invar, HiMu80, N-155, Haynes No. 25 (L-605), Hastelloy F and Hastelloy X, Armco 17-7PH, Titanium alloys, A-286 and others.

Here's why it will pay you to consult Carpenter about corrosion and heat-resistant tubing for pressure, mechanical, structural and sanitary requirements: The wide variety of types, grades, shapes, finishes and sizes illustrated can be supplied in the many standard and speciality analyses listed above. You benefit from over a quarter century of experience in helping equipment designers and builders solve a vast assortment of corrosion and heat problems. Carpenter's meticulous quality control assures you of getting tubing and pipe of the highest possible degree of perfection. Technical and metallurgical assistance with your materials selection and fabrication and nation-wide service on your requirements are available through qualified Carpenter Distributors and Representatives in over 40 cities.

Put your problems in Carpenter's capable hands today. Ask for Bulletin T.D. 120.

MEMBER

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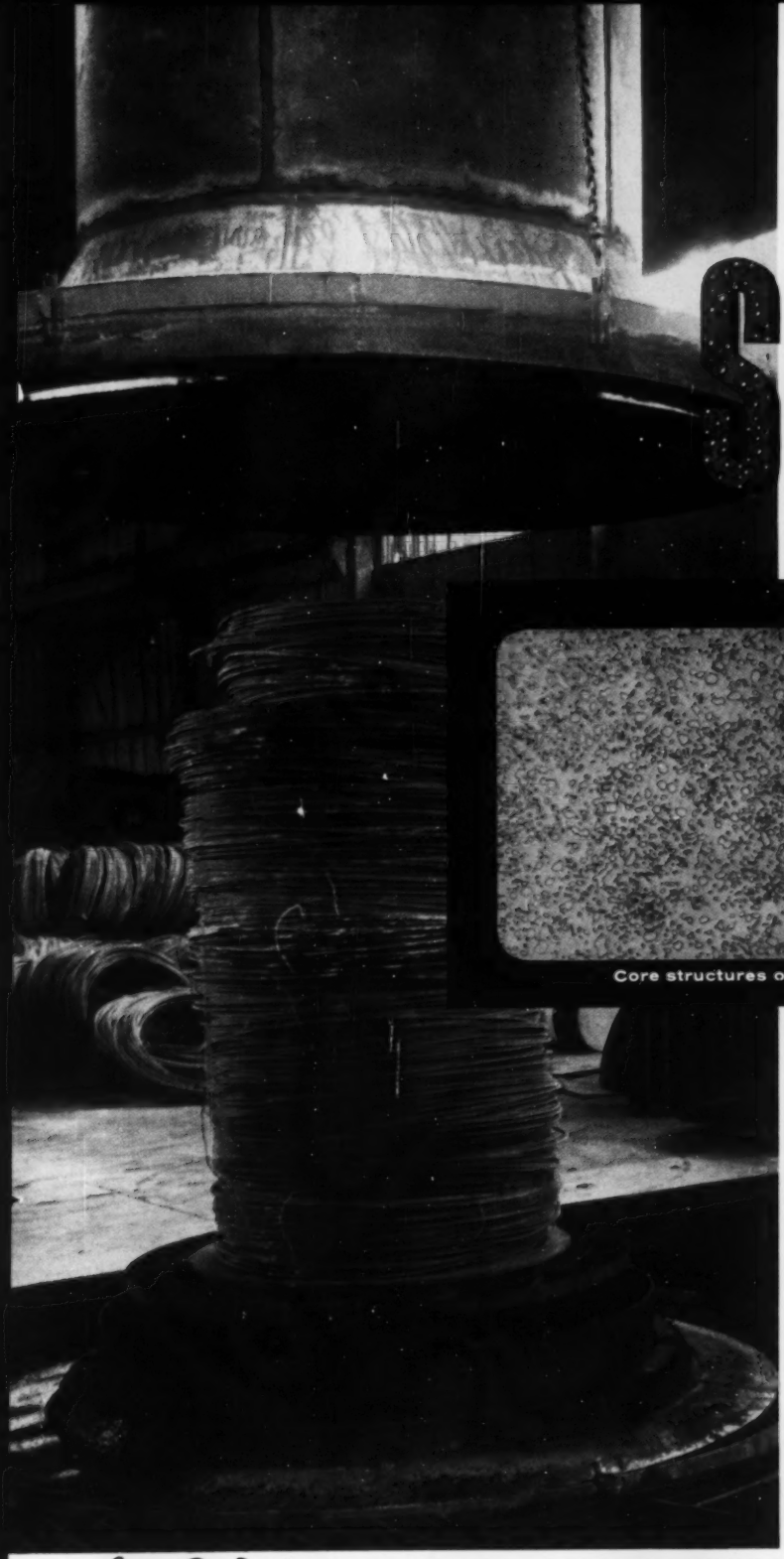
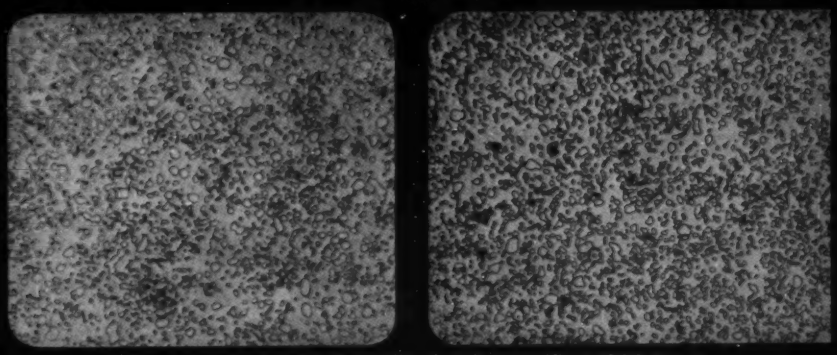


HERE'S Spheroidizing AT ITS FINEST...



Core structures of spheroidized rod, magnified 1000 times.

SPHEROIDIZING PROCESS MADE EASY WITH LEE WILSON HIGH CONVECTION FURNACES

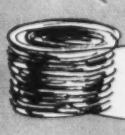
Nothing rolls like a ball — this applies to bearings as well as the grain structure of steel which is to be formed cold into bolts, auto bumpers, lock washers or razor blades.

To get this spheroidal structure in steel, the metal must be uniformly heated, but in no part overheated, and, after all parts of the charge are at the temperature required, it must be uniformly cooled at controlled rates so that the iron-carbon grains will have the shape of a ball as they form.

This heat treatment of steel has enabled fabricators to eliminate slow and expensive hot forming processes and to cold form a multiplicity of items at almost unbelievable speeds.

The Lee Wilson High Convection Bell Type Annealing Furnace with uniform heat application, specialized cycle control, and gas circulation up to 25,000 cfm. under a sealed inner cover, was designed specifically to meet all the requirements for uniformity and closeness of control demanded by this process.

Lee Wilson* ENGINEERING COMPANY, INC.
20005 WEST LAKE ROAD • CLEVELAND 16, OHIO



HIGH CONVECTION ANNEALING FURNACES
MAKE THE BEST METALS BETTER

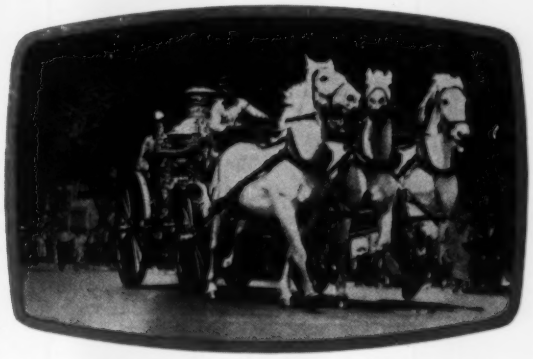
*ORIGINATORS AND LEADING PRODUCERS OF HIGH CONVECTION ANNEALING FURNACES

SEE TIMKEN TELEVENTS ON NETWORK TV

Two big hour-long spectaculars this fall

Over 126 NBC STATIONS, SEPTEMBER 23rd

"Eleven Against the Ice", the story of the Antarctica Turnpike. See men and machines build a trail across Antarctica's frozen wastes—in spite of 200 mph winds, temperatures of 120 degrees below zero and crevasses big enough to swallow a 20-story building. It's a triumph of engineering and human courage, a whale of a television show.

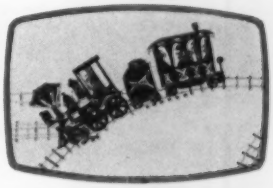


Over 142 NBC STATIONS, NOVEMBER 21st

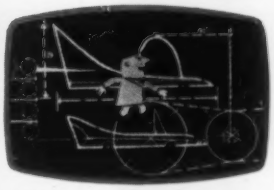
"The Innocent Years". Recaptured from exciting old films and newsreels, you'll see happy days relived. Experience the excitement of "Teddy" Roosevelt, Thomas Edison and Mark Twain in action. Hear songs like: "In the Good Old Summertime", "He'd Have to Get Out and Get Under". Enjoy the fun of family picnics, the joys of people in the last untroubled time in our history.

And commercials that help you sell . . .

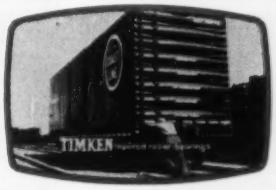
See How man stumbled on the concept of the wheel.



See Why America's railroads have always led the world.



See Why Americans jump for the latest thing in cars.



See One man push a freight car all by himself.

Years of national and trade advertising, backed by their superior performance, have made "Timken" the best-known name in bearings—a name that helps to sell the products that use Timken® bearings. Now, network television will build even a greater awareness of Timken bearings—make them an even bigger sales plus in the equipment you sell. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN TAPERED ROLLER BEARINGS

"TIMKEN" TRADE-MARK REG. U. S. PAT. OFF.